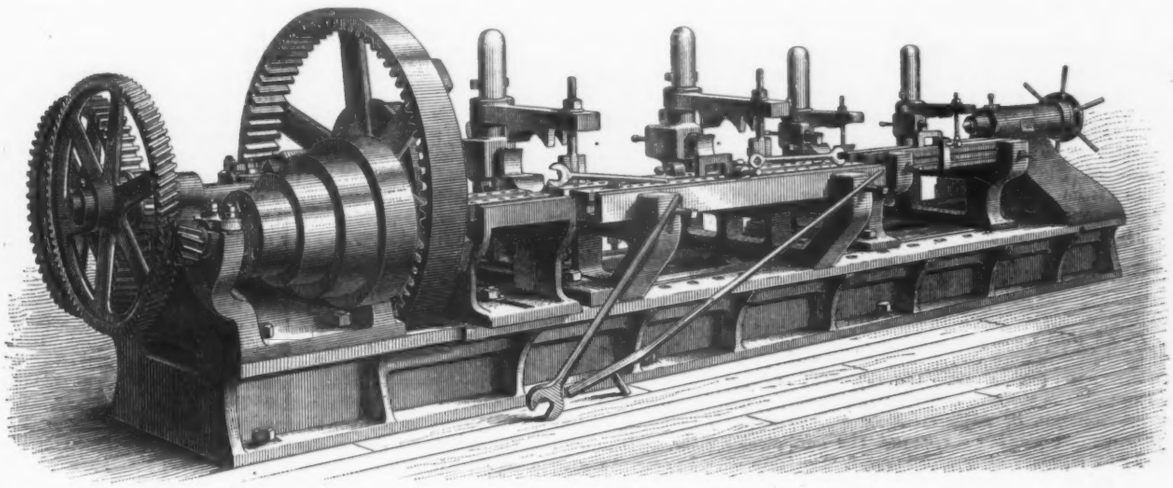
THE IRON AGE

THURSDAY, DECEMBER 12, 1889.

Roll-Lathe.

We herewith illustrate a roll-lathe of new design, built by the Lloyd Booth Company, of Youngstown, Ohio. The bed can be made of any desired length, from 14 to 22 feet, and is heavily ribbed and planed the full length on the top face and on both sides. The head-stock is very heavy. The spindles are of steel and run in babbitted journals, which are well scraped and brought to a bearing. The cones have four changes of speed and the gearing is 163 to 1, giving ample power to work several tools at the same time on the face of a chilled roll.

The lathe shown is fitted with two sets of housings—the small ones to take in rolls from 6 to 14 inches in diameter and the larger ones to take rolls from 12 to 30 inches in diameter over the collars. As shown the rests are of the "piano" pattern, being made the full length of the largest roll to be turned. The tail-stock is very wide at the base and well braced. The housings, necking-rest and tail-stock are held securely by bolts which fasten in T slots running the full length of the bed. The total weight of the lathe complete is 20,000 pounds.



ROLL-LATHE, BUILT BY THE LLOYD BOOTH COMPANY.

Firing Pottery Kilns with Producer Gas.—Several months ago a Taylor producer was erected at the International Pottery, in Trenton, N. J., for firing their decorating-kilns with gas from anthracite coal. It proved to be successful, bringing out the colors much better and giving a finer gloss than had ever been obtained before in any direct firing. The result was so satisfactory that two more Taylor producers were erected at the same pottery by the Taylor Gas Producer Company, of Philadelphia, to fire a biscuit kiln, which was altered for gas-firing and regenerators added for preheating the air by Frank C. Roberts, C.E., of Philadelphia, and Mr. Burgess, president of the pottery company. This kiln has made two successful burns. The regenerators are small, yet the economy in fuel was very marked notwithstanding that all appliances for utilizing the heat were in an experimental state. In the last burn 13 tons of anthracite buckwheat were used in the producers against 16 tons egg required in direct firing. The latter costs almost double per ton. The successful development of the Taylor producer will undoubtedly lead to much pottery-kiln firing with producer gas.

Pneumatic-Railway System.

The Pneumatic Railway Company of the United States, at its office in Philadelphia, recently, gave a practical illustration of the propulsion of railway cars by its pneumatic system. On a track about 40 feet in length a car capable of holding 12 to 15 persons was run to and fro and stopped at will, the power being supplied by a small engine connecting with pneumatic tubes which extended along the center of the track. The system, as explained, "consists of a cast-iron pipe laid in lengths, like water and gas mains, between the rails of the line and attached to cross-ties which support them. On the top of the pipe is a narrow longitudinal opening, which for the purpose of rendering the pipe for the time air-tight is covered with a valve. The tube is of the same diameter throughout, and has a piston fitted into it, likewise made air-tight, and which is provided with a 'coulter' formed of strong plate-iron and projects through the longitudinal opening in the pipe, forming a connection between the piston and the passenger car. The tube being exhausted in front of the piston by an air-pump worked by a stationary steam-engine, the piston is acted upon behind and propelled forward by the air which finds admission into the 'main' by the opening of the valve on the passing of the 'coulter.' This opening through which the 'coulter' passes is raised only a few feet in length at a time, and not in advance of the piston, the valve being opened and replaced air-tight as before; the tube is left ready to be again exhausted by a stroke of the air-pump for the next car."

The Lake street elevated railway in Chicago suspended preparations for construction somewhat mysteriously a short time since. It now transpires that the company determined to make a radical change in their plans, for which time was needed. The original design adopted by the company contemplated a road built on the Meigs system, and the ordinance passed by the City Council explicitly stated that such a road was to be built. The company now propose to substitute for the Meigs system a double-track structure similar to the New York roads. The radical change thus made introduces complications which may defer the building of the road for months, especially if the city authorities decide that property-holders along the line must sign new petitions and the City Council must pass a new ordinance. Contracts for much of the material needed have been placed, but deliveries will probably be deferred until the complications mentioned have been overcome.

The St. Clair Tunnel.—Curious appliances are being used in the construction of the St. Clair Tunnel, under the Detroit River between Sarinac and Port Huron, for the Grand Trunk Railway Company. The cost of the work is estimated at $3,000,000, and at the rate the excavation is now progressing—about 7 feet a day—it will be finished in two years. The ground under the river is a hard blue clay, and it was thought at first that the shields could be driven through this without any digging. With this idea 12 hydraulic rams were provided, each capable of exerting a force of 24,000 pounds, but they could not drive the shields an inch. The plan was then changed, and a crew of eight men, with picks and axes, now dig out a certain section in the center, the pressure is then applied, and the shields are driven 18 inches, the clay curling into the center space dug out by the men. This clay is then thrown upon cars and drawn out, and the men dig out another central section. As soon as the shield is advanced the wall, consisting of circular sections of iron packed at the joints with asbestos, is put in. A double railway track is also laid as the work progresses, so that when the two shields meet somewhere near the middle of the river the tunnel will be completed. In case water enters from the bottom of the river freezing machines are at hand to freeze it and prevent the inflow.

It is reported that the Worcester Steel Company contemplate the erection of a furnace plant on Narragansett Bay, to use local titaniferous ores and Rhode Island anthracite.

Spiral-Geared Planing Machine.

[*With Supplementary Sheet of Engravings.*]

In our issue of October 3, 1889, we presented an engraving of the 36-inch patent spiral-geared planing-machine built by William Sellers & Co. (Incorporated), of Philadelphia. This machine was exhibited at the Paris Exposition and attracted great attention on account of the novelty of its design and the remarkably smooth work performed by it. In commenting upon this machine the *Revue Industrielle* says: "The Sellers machine is a most remarkable one, not only taken as a whole but by virtue of the special American ingeniousness of the chief details of its construction. The fact is that it works so smoothly and the automatic precision of its movements is so great that the apparent complication of the machine is soon lost sight of."

Before entering upon the detailed description of the machine as illustrated by the accompanying drawings we will briefly outline its more prominent characteristics. The reciprocating motion is produced by friction-clutches, not by shifting belts. The clutches are small in diameter but certain in action, reversing the motion without jar. The return-stroke —eight times the speed of cut—is the greatest ever obtained on a planer without overrunning the required distance, and the machine will plane to a shoulder with certainty. The feed is distinct from the motion of the table and is positively driven from the slow-running pulley through an appliance for transmitting and arresting motion. The feed takes place while the machine is reversing, and at the end of the back stroke if desired, no matter in what direction the feed is working. The machine is operated from either side by levers that control the table motion, and at the same time can at will cut loose and arrest the feed, so that the table can be run past the stops as often as required for examination or adjustment of work, and when the planing is resumed the cut will show no mark of the feed arrest. The feed is adjustable from one whole revolution of the feed-screws down to nothing by an infinite gradation. The tools of the vertical slides stand in line with the main tools operated by separate feed, and can be lowered below the top of the table when not in use; 36 x 38 inch planers and larger have lifting-machinery for the cross-head, which is operated by means of friction-wheels that can be held to their work without much effort, but which stop as soon as the workman releases his hold on the lever, this being to avoid the accidents arising from hoisting-machinery set in motion and then left to work during the absence of the operator.

The bed A of the planing-machine is put in motion by a spiral pinion, C (Fig. 3), which engages with the rack. The shaft D is driven by gear F, and the endless screw G is arranged high enough to allow the driving-pulleys I and K (Fig. 1) to be placed over the floor. By means of this double-screw driving apparatus the bed is given an extremely smooth motion, altogether free from the almost unavoidable vibrations caused by the use of ordinary gearing, even when the velocity of motion is very rapid, and which could not be obtained if the ordinary gearing were adopted. This freedom from clatter and vibration is due to the close contact of the spiral pinions with the teeth of the gear and with the rack of the bed.

To the shaft H of pinion G there are attached two pulleys, one of the two, I, being a large one pushing the bed slowly onward, and the other small and rapidly-working one, K, drawing it back. These pulleys are each provided with a taper seat of wood, adapted to receive the double friction-clutch L, which is keyed to the shaft H so as to revolve with it and at the same time slide freely along it. The double friction-clutch is shown in the drawings as constructed entirely of metal, to be as light as possible, while the diameter is the smallest that will transmit the power of the pulleys safely, the object being to reduce the momentum of the clutch to the minimum, that it may offer the least resistance to the reversal of its motion when it engages with either pulley. The interior surfaces of the clutches in each pulley are lined with wood, as two metal surfaces might cut and seize. The wood is secured in place by a groove or recess turned out in the pulley-rim, as shown in Fig. 5, and into this groove blocks O, of hard wood, are fitted so that the end of the grain will form the friction surface. The space between these blocks O is made tapering (Fig. 7), and wedges P, drawn up by bolts R, set the blocks O O firmly against the rim of the pulley and so form a solid clutch, the interior being turned out to the same bevel as the outside of the double friction-clutch L. The weight of half the wooden blocks and wedges is thus added to the weight of each pulley, the motion of the pulleys being constant. Increased weight of pulley will assist in overcoming the resistance of the clutch L to the reversal of its motion without shock.

The collar J has a slot in it through which the pin Q slides. This pin fits in the clutch L and serves to couple it with the rod h by which the clutch L is engaged with and disengaged from the clutches in the pulleys. In Fig. 5 the clutch is shown in gear with the driving-pulley I. The shaft H has a hole drilled through its center to receive the rod h, which slides freely through it. This rod has an enlargement on its outer end which is slotted to receive the short ends of the bell-crank clutch-shifting levers l l, also shown in Figs. 6, 8 and 9, which pass through slots in the shaft. These levers are pivoted in a piece, n, which slides easily on the outside of the shaft. The fulcrum piece n (Fig. 9) is limited in its motion in one direction by the adjustable stop-collar p screwed and clamped on the end of the shaft. The long ends of the levers are moved in and out by the diagonal grooves p^2 in the sliding cam m as it is moved along the shaft, the levers being provided with projections on their ends which enter the grooves. At one end the grooves are continued parallel with the shaft so that when the cam is moved along the shaft until the ends of the levers enter these parallel groves, the end-pressure on the shaft, due to moving and holding the levers, ceases, and the parallel grooves resist the tendency of the levers to open or close, as the case may be. The cam is always moved far enough in engaging the clutches to bring the parallel grooves to the ends of the levers, thus always moving the levers through the same angle, and hence the position of the adjustable collar p determines the pressure with which the clutch L is forced into the driving-pulley I when the cam m is in the position shown in Fig. 5. When the cam is moved to the position shown in Fig. 6 the clutch L is withdrawn from the pulley I by the rod h and drawn into and engaged with the return-pulley K. The sliding fulcrum n in this case has been drawn away from the stop-collar p and is now shown arrested by the compression of the spring r, with which it is connected. The spring abuts against the end of the shaft, and when compressed holds the clutch L into the pulley K. The spring s (Fig. 8) fits loosely on the outside of the sliding fulcrum n and is compressed between the adjustable stop-collar p and a shoulder on n.

In Fig. 8 the cam is shown in its middle position and the clutch is free from both pulleys and the shaft is at rest, the pulleys revolving freely on it. The sliding fulcrum is now balanced between the two springs s and r. Whenever the sliding-cam m is made to move either to the right or left, the first effect of such displacement is to cause the friction-clutch L, by means of the levers l l and the rod h, to catch either into pulley I or K and to subsequently compress the springs r or s, in this manner gradually tightening the grasp of the friction-clutch till it begins to work. The extremities of levers l l are then to be found in the horizontal portions of the grooves p^2, hence the sliding-cam m then ceases to be operated upon. As at the same time the pushing forward of the friction-clutch toward the pulley in operation receives support from the abutment collar J, it is evident that the shaft H is not subject to a horizontal reaction.

When the shaft is revolving in one direction, driven by one of the pulleys, and the clutch is shifted to the other pulley, so as to revolve it in the other direction by mechanism described below, the spring presses the revolving clutch which has just been withdrawn from one pulley against the clutch on the opposite pulley, and its compression determines the brake pressure which acts to bring the shaft rapidly to rest without shock preparatory to firmly engaging with the clutch on the pulley to drive in the opposite direction, and by properly proportioning the strength and amount of compression of this elastic connection and the angle of the clutches it is easy to reverse the heavy table at high speed without any shock or jar. The angle of the clutches is such that the friction surfaces part the moment the pressure which holds them together is removed.

The lever u, pivoted in the pulley-frame, is coupled with the cam m by a collar. On the hub of the driving-pulley I is secured a spur pinion which, through the intermediate gear C', drives the gear d' secured to the escapement-shaft M, which turns freely in bearings in the upright E (Fig. 2). To the other end of the shaft is secured the ratchet-wheel T (Figs. 12 and 14). Between the ratchet-wheel T and the bearing of the shaft M is the gear-wheel V, carrying the escapement-pawl e'. This gear is loosely fitted to the shaft M, so as to allow the shaft to revolve freely within it. This mechanism with the escapement-plate next mentioned constitute a device for transmitting and arresting motion.

The pawl e' is in the form of a bell-crank and is pivoted to the hub of the gear-wheel V, its outer end resting against a stop h' on the escapement-plate W. The spring-plunger f' presses against the inner end of the pawl e', and whenever the stop is removed will throw it into gear with the ratchet-wheel T, secured to the revolving-shaft M, and thus drive the gear-wheel V. The outer end of the pawl e' comes alternately in contact with the stops g' and h' on the escapement-plate V, which has a motion at right angles to the axis of the shaft when it is required to transmit rotary motion in one direction only. The forward movement of the wheel V, carrying the pawl e', then throws the inner end of the pawl out of gear with the ratchet-wheel T and compresses the spring on f'. The reaction of this spring would tend to reverse the movement of the gear-wheel V and so cause the pawl e' to engage again with the ratchet-wheel, to be again thrown out by the stop. This would make considerable noise and be rapidly destructive of this part of the machine, and to avoid this difficulty there is provided the retaining-pawl j', which engages alternately with the two lugs k' on the hub of the bevel and spur-gear A', driven by the gear V, and thus prevents reaction and keeps the pawl e' out of gear with ratchet-wheel until the pawl e' is again released from the stop g' or h'. The pawl j' is preferably placed so as to engage

with stops on the spur-wheel V, but is shown on the wheel A′ for convenience in drawing.

The escapement-plate W is moved up and down to release the pawl e' from the stops h' or g' by means of the escapement-lever B′ (Fig. 10), one end of which engages with two lugs on the lower end of the escapement-plate W. The other end is formed as a counterweight to balance the plate W. The lever B′ is carried by and turns freely on a sleeve on G′ (Fig. 11), which is secured firmly in a stand bolted to the feed-gear frame E′. The escapement-plate W slides in bearings formed in the feed-gear frame and is kept in place by the stand, under which it slides freely. The escapement-lever B′ is provided with a friction-clutch, which engages with the friction-clutch F′ (Fig. 11), secured to the shifter-shaft G′, which is carried by suitable bearings in the feed-gear frame and feed-stand on opposite sides of the machine. Secured to the shaft G′ is the forked lever I^2, which is moved back and forth by the shifter-levers J′ and K′, operated by the stops L′ M′, secured to the table A in the usual manner as shown in Figs. 10 and 11.

When the bed A reaches the utmost limit of its forward movement the catch L′ pushes the lever J′ (Fig. 10), which causes while pressing on the double lever I′ the reversing shaft G′ to rotate (Fig. 11), together with the lever N′, held at its extremity. In this manner the coupling-rod O′ lifts the lever u out of its position, as shown by full lines (Fig. 5), into a position indicated by the dotted lines and disengages the friction-clutch L from the pulley I, drawing it in the direction of the returning pulley. But this direct putting in motion of the shaft G′ by means of the peg does not complete the clutching of L into the pulley K to a degree involving the working of the machine; all it does is to prime it by pushing the friction-clutch sufficiently to bring it to a stop like a brake through its friction on the pulley K. This friction stays the motion of the bed A without any shock by causing the teeth of the spiral screw-driving contrivance C G (Fig. 3) to get into contact in a backward direction, then commencing the grip of the clutch without bringing the entire mechanism into play. The final clutching is brought about through the instrumentality of an arched lever F^2 (Figs. 10, 15, 16 and 17), which is pushed by a cam, E^2, out of position (Fig. 10) into position (Fig. 17), the lever N′ being at the same time pushing back the coupling-rod H^2. But it is not the shaft G′ which operates directly on the cam E^2 and causes it to move. All it does is to allow the movement to take place and to restrict it, being operated upon by a system of pawls which we shall follow up in their evolutions through Figs. 5, 10, 11, 12 and 14.

As exhibited in Fig. 14 the cam E^2 is mounted on shaft D^2, which receives by the train A^2 A′ V its motion from shaft M, which in its turn rotates continually, whether it be in one direction or another, through the impulse received from b' C d' (Fig. 5), the moving pinion of which, b', is mounted on shaft H. Now, the wheel V (Fig. 14) is not firmly attached to the shaft M, but loose, and only revolves with it when made to do so by its pawl e' (Fig. 12), catching into the ratchet T, as above explained, held on M. This will evidently take place the moment the stop h' is lifted, leaves free the vertical arm e'' of the pawl e', bent at right angles, and thus enables the spring f to repulse the horizontal arm e', which in this manner catches into T. For this purpose there is wedged to the stop h' a slide, W, which can be made to move from below upward when operated upon by a contrivance which we shall describe further on, and which is furnished at g' with another abutment. At the time the movement—which we study at present—shifts for the first time to become a backward instead of a forward motion, the slide W rises, the spring f' pushes e' back to the bottom of the teeth of T while this wheel immediately causes V to move from the left to the right or in the same direction in which the hands of an indicator on Fig. 12 move, till the abutment of e'' on the tappet g', which has moved upward together with W, again disengages e' from T and stops the motion of V. In other words, at every change of movement V describes a semicircular path either toward the right or toward the left, according to the direction in which the shaft M revolves, its freedom of oscillation being strictly limited to a semicircular one by the take-up pawl j' kk' of pinion A, which intervenes between V and A^2, the semi-gyration of V, communicated by A^1 A^2 D^2 to the cam E^2, shifts, as will be easily understood, the lever F^2 from the position (Fig. 10), the proper one for the onward movement of the bed, to position (Fig 17), where the friction-clutch L closes tightly for the backward movement. Besides, as Figs. 15 and 16 show, if the coupling-rod H^2 meets with too much resistance, the crank-handle f^2 h^2 pivots around h while ascending the inclined plane h^3 in spite of the spring h^4. In this manner an excessive tightening of the friction-clutch L (Fig. 5) is prevented.

It now remains to be explained how the shaft G′ operating the change of movement communicates to the slide W the alternating up-and-down motion operating the spring-catch T. The plate or slide W receives this movement from a lever, B′ (Fig. 10), on the shaft G′ and caused to revolve around the latter by means of a friction-clutch, F′ (Fig. 11), closed tight enough to be carried along by shaft G′, when it begins to revolve the moment the catch of the bed pushes its lever, but the friction of which enables the lever B′ to slide toward F′, when the catch prolongs its motion and the rotation of shaft G′ more than is requisite to allow the stops h' and g' (Fig. 12) to come into play, whose pressure on the edge of T thus prevents any shock taking place. The degree of tightness of the grip of friction-clutch F′ is regulated by the pressure which the little arm of lever Q′ exercises on it, the latter being articulated at i and weighted at the opposite end with counterpoise Q^2.

The inertia of the double friction-clutch and driving-gears is sufficient to drive the table on its bearings about twice as far as it would move of itself. From what we have above said it will be seen that a brake-power is applied to the revolving clutch, back-lash is taken up and the opposite pulley is clutched. This nice adjustment and design does away entirely with all shock.

For the penetration of the tool, the shaft U′, on which the intermediary pinion A′ is held, is furnished with (Figs. 12 and 14) a disk-handle, V′, whose variable motion coupling-rod imparts to the quadrant W′, around its pivot Z′ (Fig. 11), an oscillating movement which is transformed into periodical rotation, always in the same direction as the ratchet shaft X′ and the screw E, which regulates the downward motion of the head-stock cross-piece. The opposite end of this cross-piece is given by the screw E′ (Fig. 2) and by the quadrant H, attached by means of T′ to the quadrant W′, a movement similar to that of E, thus keeping it exactly parallel to the bed A. Whenever this automatic forward movement is not required, pinion A′ is slack on its axis U′. The lateral forward motion of the tool is brought about through the instrumentality of the quadrant C^3 (Fig. 2) driven by the coupling-rod C^2, whose articulation B^2 (Fig. 11) is fixed with an eccentricity variable at will on pinion plate A^3. The rope for raising the head-stock at every return of the bed passes over an eccentric, J (Figs. 15 and 16), slack on shaft G^2, around which it is given an oscillatory motion by means of the coupling-rod K^2 articulated as L^2 on the eccentric and at M^2 on the cam K^2.

On reverting to the forward and backward motion of the bed—a special feature in the machine—it will be seen that the friction-clutch L is, in the case under examination, disengaged from the forward-motion pulley I by the movement of the bed itself; hence the length of motion is rigorously determined by the distance separating the catches L′ and M′. Furthermore, the slide W begins to operate the moment the shaft G′ commences to revolve and as soon as the catches operate on the reversal levers The forward motion and lifting of the tool consequently take place while the friction-clutch L catches into the return-pulley and the bed A is at rest, the result being that the movement of the table may be restricted to the length of the piece to be planed. When the receding movement of the bed terminates it is of course the catch M′ (Figs. 10 and 17) that will, by pushing lever K′, disengage the friction-clutch L from the pulley K (Fig 5) and at the same time exercise a pressure on spring S. The reaction of the latter on the coupling-collar n pushes the friction-clutch L back toward the pulley I and thus assists in effecting the commencement of tightening. The latter, the same as heretofore indicated, will at first stop the helicoidal play of the train C G′ (Fig. 3) before the reversal, properly speaking, of the bed's movement. This reversal will take place the same as we have described the backward motion, but it will be slower.

The lever R^1 (Fig. 10) enables us to stop at will and by hand the movement of the bed A, and for that purpose it has at its base a key R″ (Figs. 18 and 19) which turns in the socket N (Fig. 1). On turning this key to 90° of the position represented in Fig. 19, it pushes back the pin S′, which, supported by the shoulder-plate T′ (Fig. 11), forces the shaft G′, firmly connected with N′, to recede toward the right and thereby to disengage the reversal friction-clutch F′. After this is done the shaft G′ may be made to revolve by means of levers y and K′, or by hand by using the lever R^1, without moving the reversal-plate W′. On the other side of the frame of the planing-machine (Fig. 20) will be found a lever, R^2, similar to lever R^1, in a socket, N, in which the shaft G′, held with grooves and tongues Y, is able to slide without allowing the socket, held in position at H′, to take a longitudinal movement. The result of this contrivance is to permit the control by means of these two levers, R^2 and R^1, and by hand, on both sides of the machine, the motion of its bed. On turning one of these levers to 90° of the position (Fig. 20) the catches L′ or M′ only disengage the friction-clutch L′ without locking it, thus enabling us to adjust by hand, at pleasure, the position of both the bed and catches in order to change the movement.

Fig. 4 represents in detail slides of the bed A on the frame B of the planing-machine. The slide on the right hand, c, is flat and protected by the ribs d d; the slide on the left hand is in form of a very obtuse V. The inclination of the sides of V suffices to prevent the bed from getting laterally out of place under the oblique pushing that may result from light finishing passes, and this is done without perceptibly increasing the friction of the slides. The pushing that may result from rougher handling is, on the contrary, supported by the guides f f, which are almost vertical and never interfere with the light working; hence their wearing out will by no means affect the exactness and neatness of the work performed.

French sugar machinery is being introduced into several estates in Cuba, and good results are looked for.

Armored Cruising Monitor.

This vessel is popularly known as the Thomas monitor, the design having been prepared by the Hon. John R. Thomas, member of Congress from Illinois and member of the House Naval Committee. She is a submerging vessel with thick turtle-back armor, carrying a heavy battery and having for this type of vessel a great speed. The principal features are:

Length on load-line	235 feet.
Breadth, extreme	55 feet.
Cruising draft	14½ feet.
Cruising displacement	3130 tons.
Indicated horse-power	7500.
Speed	17 knots.
Coal supply	550 tons.
Tons per inch	21.3.

SCANTLING AND GENERAL CONSTRUCTION.

The inner keel is 20 pounds, the outer keel 25 pounds. The vertical keel is 48 inches deep by 20 pounds, width 3 x 3 inches of 7-pound angles at the top and 3½ x 3 inches of 8-pound angles at the bottom. There are three 15-pound longitudinals on each side of the vertical keel, with a 3 x 3 inch 7-pound angle at the top and bottom secured to 10-pound frame bracket-plates by angle-clips 2½ x 2½ inches of 5 pounds per foot. The frame angles are 4 x 3 inches of 8 pounds per foot. The reverse frames are of the same size in the double bottom; above that they are 3½ x 3 inches of 7 pounds per foot, with 10-pound bracket-plates; the frames are spaced 4 feet. The inner bottom is worked flat and is of 12½-pound plating, except the keelson-plate, which is 15 pounds. The bulkheads are generally of 10-pound plating stiffened by 3½ x 3 inches of 7-pound angles.

ARMOR.

To obtain as great an armored protection as possible on the small displacement the armor is disposed in the form of the arc of a circle turning downward at the sides to 4 feet below the fighting line, the armor on the crown being 3 inches thick, increased to 5 inches on the sides. That the target presented by the hull may be reduced to the smallest limit, tanks are provided into which water can be admitted sufficient to lessen the cruising freeboard 3 feet.

A novel feature connected with the armor is the method of supporting it. Bracket frame arches are worked across the vessel from armor shelf to armor shelf. These are spaced 4 feet apart. The angles are 3 x 3 inches of 6 pounds per foot on each edge, and the bracket-plates are 10 pounds. Nine longitudinal girders made up of 12½-pound plates and angles at the top and bottom form, in connection with the frames, a most rigid support for the armor. The framing is 18 inches deep and it has worked below it a ceiling of 15-pound plating, tying together in the strongest manner the framing under the armor and forming also an inner watertight skin. In case the plates are racked by an enemy's fire, any water that gets through will be arrested by this skin, and scuppers running to the armor shelves will carry it to the bilges, from which it can be pumped. The 5-inch thickness of armor on the edges is tap-bolted from beneath to two thicknesses of ½-inch plating; the remainder of the armor, which is 3 inches, is riveted to the frames, as is usual in protective decks.

An elliptical bulkhead of 10-inch armor rising from the armor deck protects the funnel, air-ducts for forced draft, ventilators and ash-hoists. The two 10-inch B. L. R. are placed in a turret having 10-inch armor with a 10-inch citadel worked around the lower part to protect the turning, loading apparatus, &c. There is a 9-inch conning tower on top of the turret.

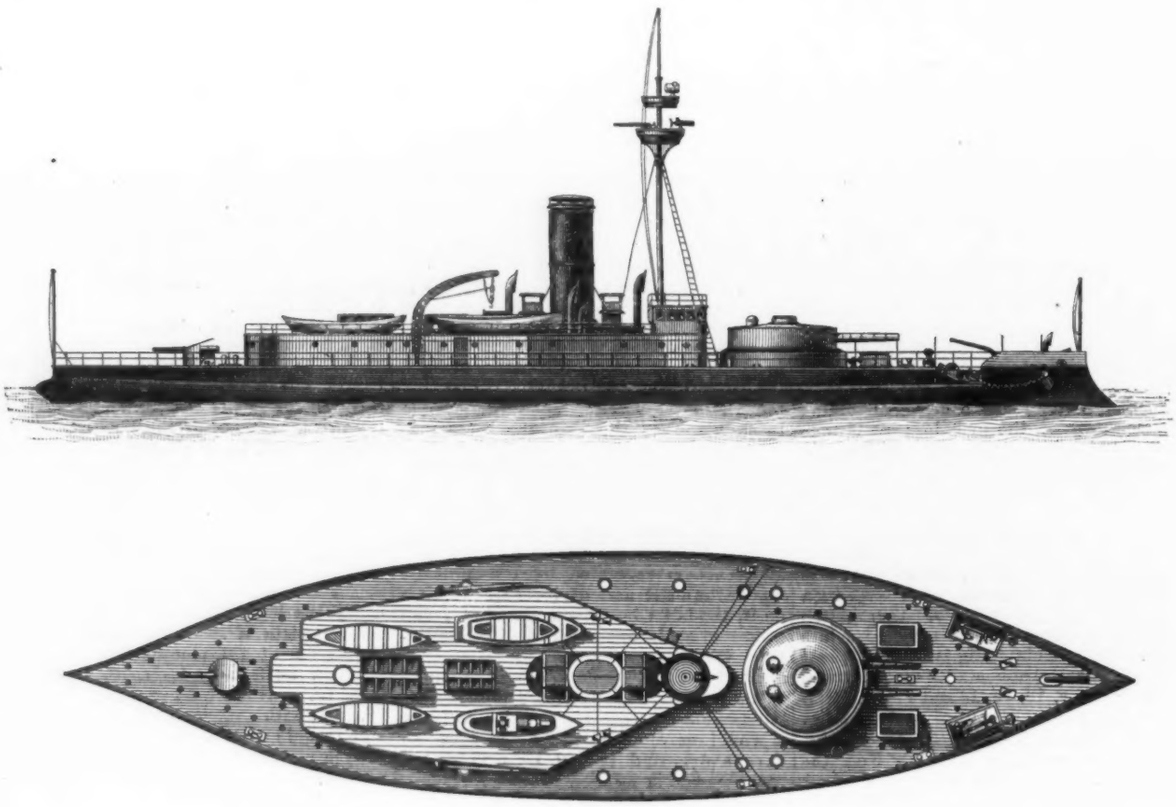
ARMAMENT.

The main battery consists of two 10-inch B. L. R., one 6-inch B. L. R. and one 15-inch pneumatic dynamite gun. The two 10-inch guns are mounted in a roller-base turret protected by 10 inches of armor; the 6-inch gun is mounted aft on a central pivot-carriage protected by a shield. The 15-inch dynamite gun projects above the deck forward of the 10-inch guns at a fixed angle. The dynamite projectiles, weighing 1000 pounds each, carrying about 500 pounds of dynamite, are carried in revolving chambers ready for loading. The secondary battery consists of three 3-pounders, R. F., and one 37 mm. R. C. One 3-pounder and one 37 mm. are in the top of the military mast, and two of the 3-pounders in the after part of the superstructure. There are two under-water torpedo-tubes, one at each side of the stem. These will be fitted for firing the Howell torpedo by gunpowder impulse.

QUARTERS FOR OFFICERS AND CREW.

There is a superstructure built above the main deck, V-shaped forward to permit a train of 65° abaft the beam for the 10-inch guns. In the after part of this superstructure is the captain's cabin, pantry, bath-room and state-room. Forward of this is a commodious ward-room, into which open ten state-rooms, the pantry, executive officer's office and armory. The water-closets are in the forward end. The boats are stowed on top of the superstructure, to which they are lifted by derricks placed at each side. The after part of the berth-deck contains three large compartments fitted with 11 transom sofas. These are ordinarily intended for the junior officers, but they can be utilized as temporary quarters by all the officers in case the superstructure is so injured in action as to be untenable. The forward berth-deck is given to the crew.

A raft-like structure is built up on the sloping armor-deck, and the level deck on top of this, a few inches above the armor-deck at the middle line, is the deck of the superstructure. The sides of this structure are of 15-pound plates, stiffened by 3½ x 3 inches of 8-pound angles, and the



UNITED STATES ARMORED CRUISING MONITOR.

beams supporting the 5 x 2¾ inch planking are 5 by 2½ inch by 10-pound angle bulbs. Within this structure on the outer slope of the protective deck is a belt of cellulose or woodite extending in 6 feet 7 inches.

MACHINERY.

The engines for this vessel are of the same general type as those for the coast-defense vessel. They are twin-screw vertical triple-expansion engines placed in separate water-tight compartments. The cylinders are 31½, 46 and 70 inches diameter by 36 inches stroke. The indicated horse-power of the main engines and air and circulating pumps is 7500 at 150 revolutions per minute and 160 pounds working pressure. The piston-valves, worked from Stephenson double-bar links, will have the following diameters: High pressure, one of 15 inches; intermediate, two of 15 inches; low pressure, three of 20 inches. The valves and valve-gear of the high-pressure and intermediate cylinders are to be interchangeable. The crank-shaft journals will be 12½ inches in diameter and the crank-pin 13 inches in diameter, with 6-inch axial holes. The sections of the shaft are interchangeable and the cranks are set at 120°. The line, thrust and propeller shafts will be about 12½ inches in diameter, with 6-inch axial holes. The condensers will have about 5237 square feet of cooling surface in each. The centrifugal circulating-pumps will have a capacity as wrecking-pumps of about 7000 gallons each. The two air-pumps for each condenser will be 16 inches in diameter by 16 inches stroke. There will be eight single-ended cylindrical boilers, 12½ feet in diameter and 10 feet 11 inches long, each having three corrugated furnaces 36 inches in diameter. The total grate surface is about 444 square feet and the total heating surface 15,050 square feet. The boiler-shells are $1\frac{1}{32}$ inches thick. The forced draft is on the closed ash-pan system.

LIGHTING, DRAINAGE AND VENTILATION.

There is to be a complete installation of electric lights, sufficient for lighting all parts of the vessel and arranged in duplicate so as to guard against accident. Connections are also made to search-lights, one being placed on a small gallery above the regular military top. The drainage system is so arranged that any compartment can be pumped out by hand or steam pumps. The capacity of the steam-pumps is to be such as to pump an amount of water equal to the displacement of the vessel in an hour.

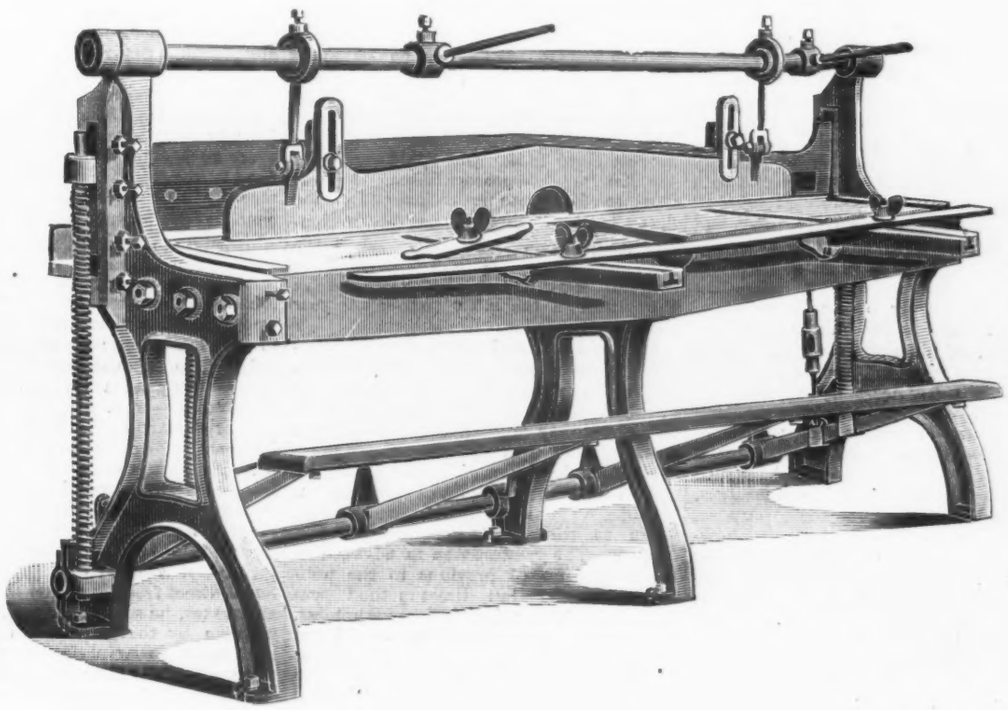
There are two fans on the forward berth-deck and two in the engine-room for ventilating purposes. These connect the air-ducts leading down through the armored protection to the funnel and are arranged by a system of main air-ducts and branches to pump into or exhaust from every compartment. Special pipes lead from the coal-bunkers to the funnel to carry off any gases that may be generated. The air for the forced draft will also be drawn down through the ventilators, protected by the armor protecting the funnel.

The vessel is submerged to the fighting trim by means of a system of valves opening into the water-tight compartments of the double bottom. These are worked from the berth-deck. The vessel can be submerged to the fighting draft in five minutes. This vessel was appropriated for March 2, 1889, the sum of $1,500,000 being voted for her construction.

Last week construction work was begun in earnest on the Lake street elevated railway, in Chicago. J. H. Greiner, superintendent of the Philadelphia Bridge Works, set a force of men at work erecting a wooden structure to be used in hoisting into position the pillars and girders of the first two panels of the superstructure. When these two panels are in position a derrick car with an engine will be placed on their tracks and the remaining work of hoisting will be done from the railway itself. The iron and steel are now arriving, as well as the ties and other material. Bids have been asked on the locomotives and cars for equipment. After many months of discussion and apparently justifiable skepticism on the part of the Chicago public the elevated-railway era of the city seems to have really set in. The other elevated-railway projects continue to show signs of life, but are not as far advanced as the Lake street.

Squaring-Shear.

The engraving here presented shows a new cornice-makers' squaring-shear, built by the Niagara Stamping and Tool Company, of Buffalo, N. Y., and made in four sizes. The 7, 8 and 10 foot shears are strengthened by a third leg in the center of the bed to prevent springing. The shear is fitted with the above firm's new compound treadle, which is simple in construction and has ample strength. The machine is also provided with an automatic gauge-setting apparatus for the back gauges, whereby the operator is enabled to stand at one end of the shear and set both gauges accurately at once. The shear is fitted with a hold-down actuated by a lever, as shown in the engraving, and is capable of cutting No. 18 gauge iron. The shear shown is an 8-foot one, weighing about 3000 pounds.



CORNICE-MAKERS' SQUARING-SHEAR.

Charles Himrod & Co. exhibit a remarkable specimen of cast-iron work in their office in the Rookery Building, Chicago. It consists of a cylinder which is 6 feet high, 20 inches in diameter and only ⅛ inch thick. Expert foundry men have pronounced the manufacture of this casting a notable feat. Its difficult nature will perhaps be better comprehended by the statement that it is equivalent to casting a plate 6 feet long and about 5 feet wide and only ⅛ inch thick. The casting is perfectly sound and weighs 160 pounds. It was made by Turner, Dickinson & Co., of Chicago, and Calumet pig-iron was exclusively used in its production.

Nashville Furnace, at Nashville, Tenn., made a trial lately of Pineville (Ky.) coke. They gradually increased the burden from 4000 pounds of ore and 2100 pounds of limestone for 2800 pounds of coke, to 5300 pounds of ore, the same burden as had been carried with Pocahontas coke.

ALUMINIUM.

BY ROMAINE COLE, WATERBURY, CONN.

Of all the metals of the earth that has been most talked about but of which less is generally known, the metal aluminium undoubtedly stands pre-eminent. One can hardly pick up a paper without seeing something about the "silver made from clay," out of which "some day ships and bridges will be built which will be as strong as steel and yet as light as a feather," and much else of similar nonsense, the product of imaginative minds sadly ignorant of the real properties of the metal we are about to consider. In the first place aluminium is not made from clay—never has and never will be. While it is true that all clays contain aluminium in variable quantities, it exists there in the form of a silicate more or less contaminated with iron, which renders the ore worthless for the extraction of the pure metal. The iron can be removed from the clay by chemical treatment, but the silica which is found in excess in all common clays cannot be sufficiently eradicated to insure a high degree of purity. Now, impure aluminium is just as bad a thing to work with or to get any satisfaction out of as impure iron or impure copper. The many excellent qualities of the metal are very much diminished if it is impregnated with too high a percentage of foreign ingredients. Of all foreign elements silicon and iron are the worst for aluminium; and as these are found to be most abundant in clays, it can be safely put down as a fact that clay will never become a source of the metal. And as for building bridges, ships, &c., of aluminium which will be "as strong as steel and yet as light as a feather," it is only necessary to say that so long as old mother earth's supply of iron ore continues to remain as abundant as it is there need be no fear of any other metal taking the place of iron and steel for such structural purposes as ships and bridges. The use of aluminium for these purposes is precluded for two reasons: 1, however cheaply it may be bought to-day or to-morrow, it will never be produced cheap enough to compete in price with iron; 2, it is not strong enough. While the weight of iron is more than three times that of aluminium, bulk for bulk, yet the latter is no stronger than copper, silver or brass. If for no other reason steel will always take the precedence over other metals for bridges, ships and for many other structural purposes, because of its great strength. In the foregoing I have made what perhaps many will consider a sweeping assertion, viz.: aluminium "will never be produced cheap enough to compete in price with iron." Let us now consider why this is necessarily so.

To H. St. Claire Deville, the French scientist, belongs the honor of first isolating aluminium in a sufficiently pure state to determine its true properties. This was in 1854. Through him the world became aware of the existence of a new and very beautiful white metal which resembled silver in luster, finish and many of its properties, but which far transcended silver in its power to hold its luster and finish against the tarnishing effect of the atmosphere. Compounds of sulphur, such as sulphurous acid and sulphureted hydrogen, generally present in the atmosphere, in-door and out, and which are the commonest as well as the worst enemy to nickel, tin, zinc, as well as silver, were found to exercise absolutely no effect upon aluminium. Here was a metal, then, that rivaled gold in its power to withstand most acids as well as the tarnishing effect of air and water, a metal, too, that was stronger than gold, though quite as ductile and capable to a considerably greater extent to resist drawing under hammer, through die or rolls. What wonder, therefore, that the entire metallurgical world was set agog over the developments by Deville or that the cheap production of aluminium has been since the metallurgical *desideratum!*

The process developed by Deville for the extraction of aluminium, and which has continued to be the only reliable process for the smelting of the pure metal until 1888, consisted briefly in the isolation of the metal from its chloride first by means of potassium. Afterward potassium was advantageously replaced by sodium. The first thing he had to consider was to procure a supply of a pure ore. This he found in beauxite and cryolite. From these a sufficiently pure oxide of aluminium was obtained, and to this day these two minerals form the chief source of the pure metal. From this comparatively pure oxide the double chloride of aluminium is made. The next step is to remove the chlorine from the aluminium, and this is accomplished by means of sodium, which uniting with the chlorine forms common salt, thus leaving the metallic aluminium free. Various modifications and improvements made by Deville himself and others, notably Webster and Castner, have brought the price of aluminium produced by this process from $100 per pound down to $5 per pound. Castner's works in England embody all the improvements made in Deville's process since 1854. One could truthfully say that Deville's process is seen there in its state of absolute perfection, and yet the death-knell of this process—as a commecial operation—was struck when the "direct reduction method" invented by Charles Martin Hall was perfected in Pittsburgh in the latter part of the year 1888.

It should be noted that the Deville process is a protracted, roundabout and expensive operation. If by any means the metal could be reduced directly from its ore or oxide in a sufficiently pure condition, thereby doing away with the expensive reactions of chloridizing and sodiumizing, we should have the treatment of aluminium, considered from a scientific stand-point, down to theoretical metallurgical perfection. The greatest step in advance of the Deville process previous to the publishing of the Hall direct method was that of the Cowles electric-furnace process, which consists of smelting the metal direct from corundum, an oxide of aluminium, by means of an electric current coupled with the reduction of some other metal such as copper or iron by solid carbon. The electricity passing through the mixture of ore, copper and carbon, by the resistance thus interposed heats up the entire mass to incandescence, as the little carbon filaments in the incandescent lamps are heated. At such very high temperatures the ore of aluminium must part with its oxygen to the carbon present, burning off as carbonic acid. There is left, then, nothing but the metallic aluminium, together with what iron and silicon that was originally in the ore. These the melted copper absorbs, thereby producing an alloy of aluminium and copper with more or less silicon and iron. The chief objections to this process are two: 1, its operation is dependent upon the presence of some metallic bath, thereby limiting its scope to the manufacture of the alloys of aluminium solely; 2, the products of this method run very high in impurities. The first objection is, of course, no objection at all where alloys only are wanted, but the last is serious, though it will, I believe, be reduced considerably by experience.

There are a great many intelligent people who firmly believe that the day will come when aluminium will be smelted from clay or some other ore and be run out of a blast-furnace into pigs by the ton just as iron is made. We have already referred to the objection of using clay—being objections based on chemical laws. Next, to reduce aluminium direct from its ore in a blast-furnace would require such a high temperature that were it possible to attain that temperature by any form of combustion it would melt the walls of the furnace long before the reducing action on the aluminium ore could have commenced. The fact is, however, that no form of combustion can possibly engender sufficient heat energy to break up the molecule of oxygen and aluminium (which compose the ore) in the presence of carbon or any other reducing agent, thereby setting free the metallic aluminium.

But, it may be objected, the Cowles electric furnace reduces the ore solely by heat. Very true; but by electric heat, please remember, which is a very different thing from burning coal or hydrogen or any hydrocarbon. Two years ago the writer experimented with a specially-designed regenerative furnace to prove this point. With this type of furnace the highest temperatures possible by combustion are attained. The walls, roof and hearth of this furnace were constructed of magnesia brick, which will stand a higher temperature before fusing than the ore of aluminium. Several tests were made, the furnace being charged with different ores, different fluxes and different metals to serve as a bath. The charges were treated from 12 to 72 consecutive hours, reversing every 20 minutes. In the history of open-hearth regenerative work there is no record of a furnace of this type being run continuously for such a length of time. It is plausible to presume, therefore, that the highest temperatures ever attained in the history of metallurgy or possible to attain (outside of the electric furnace, of course) were reached at that time. It is needless to add that practically no aluminium was reduced, though the heat was so great it melted pure silica brick and plumbago crucibles like wax.

Charles Martin Hall had been working for years before he finally succeeded in perfecting his process. Young as he is he has given to the world the most valuable metallurgical invention since that of Sir Henry Bessemer of converting pig-iron direct into steel. Realizing the utter futility of ever expecting to smelt the metal direct from its ore by means of heat and fluxes, he sought for a solution of the problem by the substitution for the heat that more powerful factor of energy in some respects—electrolysis. The idea resolved itself, therefore, into the discovery of a flux that would take into solution the aluminium ore at a moderate temperature, but which would remain unchanged and unaffected by the passage of the electric current through it and which would offer a low electric resistance to the current. Besides this, the bath (flux or electrolyte) must be of less specific gravity than the metallic aluminium, which is so very light in weight, so as to insure the metal sinking to the bottom, and thus not interfering with the operation. Now, to find a bath and proper form of apparatus to do all these things perfectly required years of persistent effort and thousands of experiments. The persistence which Mr. Hall displayed through countless failures and disappointments is worthy of admiration and emulation. Finally Mr. Hall was put in the way of properly developing his process, which resulted some months later in its perfection.

Briefly, the process and operation is as follows: A number of carbon-lined steel pots are placed in a row, the current passing from one to the other. These pots can be of any size and of any number commensurate with the quantity and force of the electric current used. The bath in each pot is kept in a melted condition, requiring but a low temperature. Plunging into the middle of each bath or pot are several large carbon electrodes. The cur-

rent passes down these electrodes into the bath, through the bath to the carbon lining of the pot and out to the electrodes of the next pot and so on. Every few minutes a stream of ore is allowed to flow into the bath of each pot, keeping the same surcharged. The ore is thus constantly being taken into solution. The electrolytic action of the current is also constantly splitting up the molecules of the ore, sending its oxygen to the big carbon electrodes and the metallic aluminium to the sides and bottom of the pot. This action goes on continuously night and day for months at a time and requires very little attention. We have here a simple and continuous process—just as much so as the blast-furnace operation of smelting iron—the ore being introduced at one end and the metal extracted at the other. The bath remains unchanged and is consequently used over and over again, which is an advantage over the blast-furnace method of smelting iron, in that a new bath or flux has to be provided with every new charge of ore. Just as the cheap and pure copper is produced by electrolysis, so is the cheapest and purest aluminium made in the same way. The Pittsburgh Reduction Company, who are working under Mr. Hall's patents in this country and abroad, are now selling pure aluminium at a cheaper rate, bulk for bulk, than nickel. The Scovill Mfg. Company, of Waterbury, Conn., are rolling and drawing the metal by the ton into sheets, rods, bars, wire and tubing, and are selling the wrought metal at a price considerably below German silver or britannia-ware, silver-plated.

In color aluminium is next to silver in whiteness. After aluminium comes tin, followed by zinc, nickel and, finally, lead, of the white metals. Rub a piece of aluminium sheet with ground pumice-stone and water and compare the finish thus made with a similar finish in silver. The latter has a milky-white appearance, while the aluminium has a softer look, which is due to the toning effect of the delicate violet tinge inherent in that metal. From a purely artistic stand-point, the softer hue of the aluminium sheet is preferable to the dazzling milky-white effect of the silver. A block of aluminium weighing 1 pound is four times larger than a pound block of silver and from three and one-third to nearly four times larger than pound blocks of brass, tin, German silver, bronze or iron. A pound of aluminium, therefore, goes a great way, which should be considered when comparing the price of this metal with prices of other metals. The tensile strength of hard-drawn aluminium is 40,000 pounds or over to the square inch, which is stronger than copper, gold or the best grades of cast-iron, and very close to the strength of hard-drawn brass. Its elasticity is superior to any of these metals. It will conduct heat twice as fast as silver and over twice as fast as copper or any other metal known. Its electrical conductivity is close to that of pure copper. Its specific heat is higher, excepting magnesium, than any metal known, which property is a valuable one for some purposes, such as dishes for food and safety devices for steam-boilers. It is unaffected by sulphur or any of its compounds. The only acids that attack it readily are hydrochloric and hydrofluoric acids. Very powerful alkalies, such as hot caustic potash, will also attack it Nitric, acetic and sulphuric acids and ammonia have practically no effect. Salt has no effect, and neither has a strong solution of salt any material effect unless the metal be left immersed in the same for a month or two, when it will have become somewhat tarnished. A strong solution of vinegar and salt will tarnish the metal after being immersed in the same for a week or two, but this is nothing against the metal, for no one is going to leave any piece of metal immersed in vinegar and salt for two or three weeks if they possess an ordinary amount of intelligence. Atmospheric moisture has no effect on aluminium, even when the latter is raised to a red heat and kept at that temperature for a long period. Soap and water cleans the metal beautifully after rinsing with clear water and wiping dry. The ductility of the metal is so great that it can be stamped up into all kinds of articles, drawn into the finest wire and hammered into leaf as thin nearly as gold-leaf. It can be cast into all kinds of shapes. It welds perfectly by electricity, but it does not solder easily, and for that reason soldering is avoided as much as possible.

There are two fields for aluminium—one field for the metal in its pure state for all sorts of fancy and useful articles, such as are now made of silver, German silver or britannia-ware, silver-plated and nickel-plated goods, and another field for its alloys with other metals.

Perhaps it is not generally known that the world-renowned Damascus sword-blades and the East Indian Wootz steel both contain very small percentages of aluminium; but chemical analysis proves this, and it is thought by some that the remarkable qualities of these two grades of steel are due to the presence of aluminium. Now, some of the best steel manufacturers in this country and abroad are using from $\frac{1}{10}$ to $\frac{1}{2}$ of 1 per cent. of aluminium in their metal, because even this small amount of aluminium will remove the occluded gases in the steel, which make what are called blow-holes, besides improving the quality of the steel in other ways. Small percentages of aluminium are alloyed with cast-iron to improve the quality of that metal, which it does very effectually. One-tenth of 1 per cent. of aluminium added to wrought-iron enables one to pour perfectly sound castings of that metal, which possess all the ductility and other superior qualities of rod or bar iron. These are called "mitis castings."

One of the most wonderful metals known in the arts and one of the most useful is made by melting pure aluminium and copper together in the crucible, the same as tin-copper bronze is made. This alloy is called aluminium bronze. Ten to 11 pounds of pure aluminium melted with 90 pounds of copper makes a casting which is stronger than a casting of any other metal or alloy known, being considerably stronger than Bessemer or open-hearth steel castings Because of its great strength, elasticity, toughness and fine casting qualities and immunity from re-crystallization (change in crystalline form and the setting up thereby of initial strains in the metal, possibly causing it to rupture), it is safe to predict that the importance of this metal for both light and heavy cannon will be recognized and appreciated in the near future by the naval authorities of this and the Old World.

The most beautiful gold metal—outside of gold itself—is made by melting from 4 to 5 pounds of pure aluminium with 95 to 96 pounds of copper. The color of this metal is so close to 16-carat gold that it will deceive those who are not experts. Next to gold it will hold its color against the tarnishing effects of the atmosphere much better than any other bronze metal. It will tarnish a little in time, but it will never turn black or green like ordinary bronze or brass, and is much more easily kept bright and clean. This alloy is very tough, but it can be cast, drawn or spun easily, soldered, electro-welded, forged hot like wrought-iron and worked up into every conceivable shape which bronze or brass is put to. In price this alloy is considerably cheaper than German silver and approximates very closely in cost to that of ordinary tin-copper bronze. Considering its superiority, it is in reality much the cheapest metal to use for many purposes.

In conclusion I will add that while the coming age may not be a strictly "aluminium age," as many think, yet I trust that enough facts concerning this metal have been pointed out to warrant the assumption at least that aluminium is destined to become the wedded wife of iron, and that as a happy couple they will rule the world and share the honors together.

New Steam-Engine Valve.

The new valve which is applied to engines manufactured by the Phœnix Iron Works, of Trenton, N. J., is the invention of W. D. Haven, the president of the company. The object aimed at is to secure greater accuracy of travel and greater durability in the valve. In an engine fitted with this valve the head of the valve-case, which is detachably secured in any suitable manner, is provided with a cylindrical sleeve extending in a direction parallel with the valve-stem. The lateral edges do not touch, but are arranged to leave space to permit of the lower half of the bushing being from time to time adjusted upward to compensate for the wear which takes place between the lower half and the stem. This adjustment is provided for by screws which are tapped into the under side of the sleeve and bear against the lower half of the bushing. In the inner end of the sleeve is fitted a ring, having between it and the bushing a space for the reception of a suitable packing. The sleeve and bushing are of such length as to permit the necessary reciprocation of the valve-stem, and as a finish and to shut out from view the moving end of the stem, the outer end of the bearing is provided with a cap which is adapted to be secured upon the sleeve. The bearing serves to balance the valve-stem by exposing to the outer air at this end of the valve-case an area equal to that of the cross-section of the valve-stem at the end next the valve-gear. To this end the cap is provided with an opening through which atmospheric pressure acts upon the end of the stem.

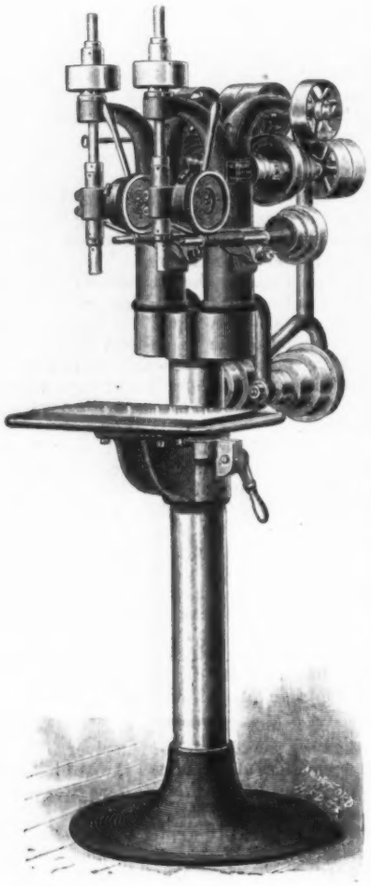
In order further to take off wear from the under side of the valve and stem, the upper port or ports of the oscillating valve-shell are made of a slightly less area than that of the lower port or ports. The result of this construction is that the weight of the valve and stem may be entirely sustained by the live-steam pressure and the friction and wear between the moving and stationary parts much diminished. There are now several engines in use containing the improvement described, which are developing excellent results.

Blasting the channel of the river in the Conemaugh Valley formed the subject of a paper read before the Western Pennsylvania Engineers' Society by Arthur Kirk. The mass at the bridge, he said, by actual measurement was 350 feet wide, extending 800 feet up the stream, and had an average depth of 20 feet. At some places in the middle of the stream it was over 40 feet deep. It was so interwoven with telegraph wire and tree roots and solidified with sand and gravel as to form such a combination as there never was in the world before. Dynamite was the only thing that could remove it, and had that not been used it would be there yet. Major Phillips, who had charge of the work of opening the channel, also gave a few features of that task. Eighteen thousand two hundred pounds of dynamite were used in all. Charges were fired ranging from 5 to 400 pounds of dynamite each.

The Lake Shore Railroad Company are preparing to lay a third track on a considerable portion of the route, and before long a fourth is possible.

Two-Spindle Automatic Drill.

The accompanying engraving illustrates a two-spindle automatic drill, with power feed and automatic stop, made by W. P. Norton, of Bristol, Conn. It is stated that this drill is original with the above firm and a new departure in sensitive drills. It is in every respect similar to their regular standard drills, but has in addition power feed so arranged as to be thrown in and out at the will of the operator, or can be set to throw out automatically, the automatic stop or trip being adjustable so as to drill any depth of hole from 0 to 4 inches and to trip with certainty at the desired depth. The spindles are so arranged as to fly back to position when through with their work. This leaves the operator free to place and remove the work and makes a very rapid means of drilling. The spindles are balanced with special coiled spring and have extra tension to cause them to fly back, and are provided with an improved adjustment to balance the weight of extra tools or chucks that might be attached to the spindles. The table is balanced with weight in



Two-Spindle Automatic Drill.

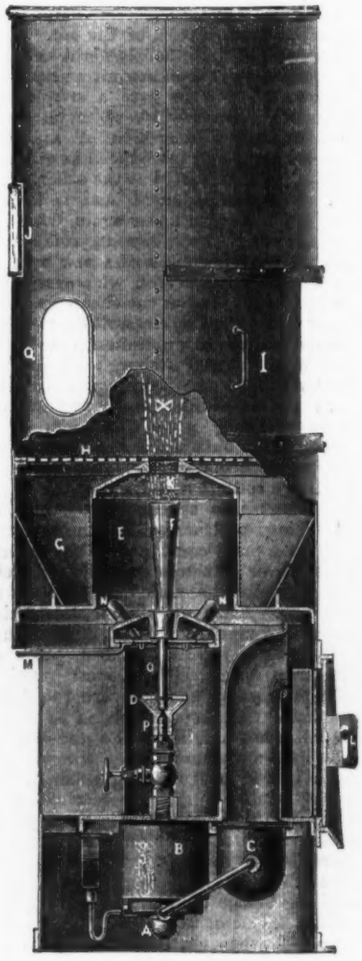
column, so that it can be easily adjusted and without danger of falling. There are three changes of speed to each spindle, also two changes of feed. Each spindle is entirely independent of the others. This permits the use of one for light and fast drilling, while the other may be used for counterboring or heavy drilling that may occur upon the same piece of work. This gives the machine a wider range than the ordinary multiple-spindle drill. It is furnished with tight and loose pulleys on back of machine, and can be driven direct from main or other line of shafting without extra counter-shaft. They will drill from 0 to ½ inch holes, 4 inches in depth, 6½ inches from column to center of spindle, and will receive work from 0 to 30 inches in hight.

Sand-Blast for Cleaning Castings.

Among the numerous machines which have been devised for the cleaning of castings as they come from the sand is that shown in the accompanying illustration. This is an adaptation of Tilghman's sand-blast and is the invention of an Englishman named Matthewson. The apparatus is particularly useful for cleaning castings which are to be subsequently operated upon by tools or plated, and also for cleaning intricately cored castings, which cannot be easily accomplished by the ordinary methods. For large castings two forms of apparatus are used. In the first the apparatus is stationary and the blast directed horizontally, the casting being suspended in front of the orifice through which the sand issues and moved about so as to bring all parts of the surface required to be cleaned under the action of the blast. In the second case the casting is stationary and the apparatus is suspended in such a way that the blast can be directed by hand against every part of the surface of the casting.

The apparatus illustated is employed in cleaning small castings which can be held in the hands of the operator over the blast. The system preferred for such work, says *Engineering*, is that in which the required velocity is given to the sand by a jet of steam. Before, however, this stream of mingled steam and sand has reached the object operated on it is met by a counter-current of air, which sweeps away the steam and allows the sand alone to pass on, so that nothing but cool, dry sand strikes the work. The velocity of the sand and its consequent cutting power can be regulated by merely increasing or diminishing the pressure of the steam. The steam enters the apparatus at A, passing through the steam-drier B into the blast-jet P, which terminates in the bottom of the cup D. The lower end of the blast-pipe O also terminates in this cup, leaving a small space between it and the blast-jet. The steam rushing out of the blast-jet into the blast-tube O causes an inrush of air. The sand from the annular hopper G flows through the inclined tubes N N and drops into the cup D, where it is at once caught up by the inrushing current of air and carried into the blast-pipe and mixed with the steam. The steam and sand then pass on together through the conical tube F, toward the hole K in the upper end of the cylinder E. The lower end of the cylinder E is open and communicates with an annular cylinder partly surrounding the blast-chamber.

Connected with this annular cylinder is a steam-jet exhausting apparatus, C, which exhausts the chamber and causes a current of air to rush in at K in an opposite direction to the stream of steam and sand. The steam being light and expanded is easily carried back by the slight counter-current of air, while the sand by its weight and velocity rushes onward alone and strikes the object placed in its path. The sand in passing through the few inches of dry, cool air is quickly robbed of its moisture and heat, and thus strikes the object in a dry and comparatively cool condition. The steam thus carried back by the counter-current of air passes into the exhausting apparatus and out into a chimney or other outlet. The castings to be cleaned, frosted or otherwise treated are placed on the perforated floor of the apparatus H through the door I, shown to the right. The workman stands on the floor in front of the machine with his arms through the armholes Q and his eyes opposite the window J. The castings are held in the hands of the workman, his hands being protected with rubber gloves, in the blast at X, and constantly turned round in order to subject all parts to the action of the blast. After striking the casting the sand falls back into the annular hopper G ready to be used again. The flow of sand is regulated by the lever M. The water



Sand-Blast Machine for Cleaning Castings.

and dust which collect in the annular cylinder are removed occasionally through the door L.

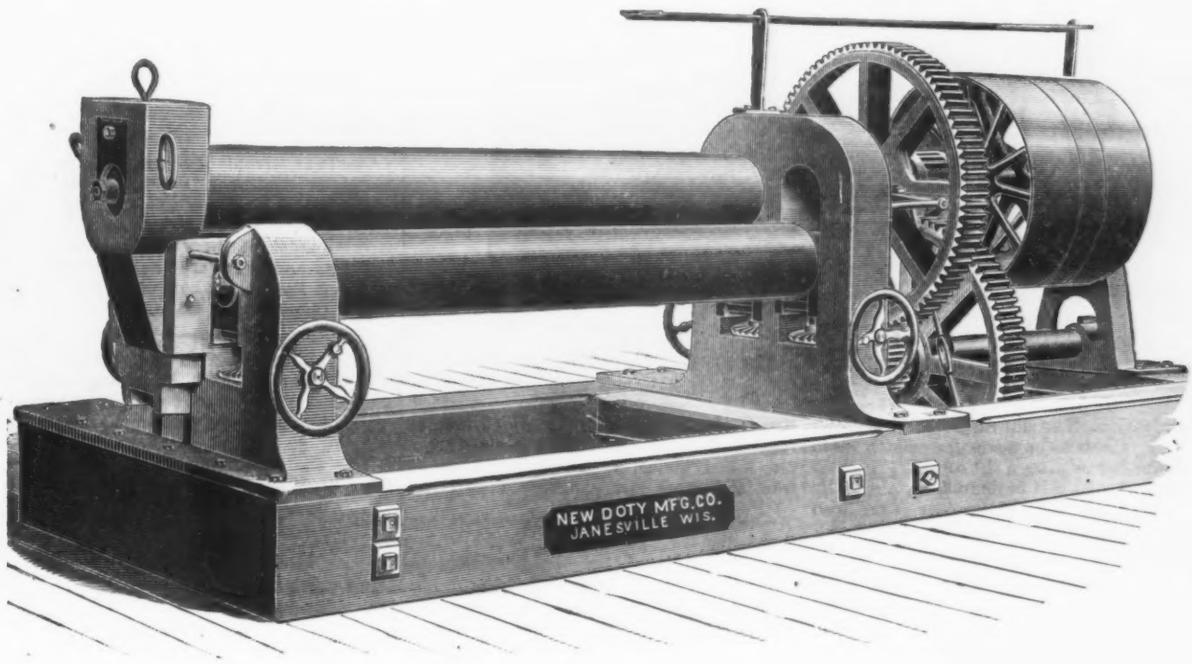
The Secretary of the Navy awarded to the Midvale Steel Company, of Philadelphia, the contract for supplying steel for use in the construction of the two 3000-ton cruisers to be built by the Government at New York and Norfolk. The price is $65,000. The contract for furnishing boiler-tubes for the machinery was awarded to William A. Wheeler, of New York, for $15,489.

The firm of Runkle, Smith & Co., of this city, have been awarded a $2,000,000 contract for supplying the city of Havana, Cuba, with a system of water-works. A member of the firm said that he considered the award a victory over English competitors.

It is said that the Boston and Montana Company have bought a site for their smelting-works at Great Falls, Mont., and have contracted with the Manitoba road for freights. It is also said that a decision has been reached that the new works shall be devoted exclusively to the treatment of Boston and Montana ores, and that the Butte and Boston Mine must look elsewhere for accommodation.

Belt[illegible]r Bending-Rolls.

In the machine we herewith illustrate, which is built by the New Doty Mfg. Company, of Janesville, Wis., and is intended for bending boiler and other plate, the two rolls which grip the sheet are placed one above the other, the third one, which does the bending, being at the back and adjustable vertically for giving the desired curvature. The rolls are of iron or steel, as desired, and the housings are made strong enough for the heaviest work. The housing on one end is hinged so as to drop down out of the way and allow the removal of the sheet after it is bent to a circle. This hinged housing when in an upright position ready for work sets in between two upright pieces on the main casting, which pieces hold the hinge in place and resist all side strain. The top roll is held in position when the hinged housing is dropped by a strap which passes over the end of the roll next to the gears and is tightened by a turn-buckle



BELT-POWER BENDING-ROLLS.

on each side. The two pinching-rolls are geared together, and are so arranged that after making one-half of a revolution they are automatically disengaged and the lower one then revolves by friction only, this being an advantage for the reason that it relieves the gears of what would otherwise be the most severe strain they would be subjected to. This strain is caused by the fact that one roll coming in contact with the outside or convex side of the sheet while the other is in contact with the concave side, there must be some slipping if the rolls are geared together and revolve at the same speed. By releasing the lower roll before the bending commences this strain is entirely obviated and much wear and breakage of gears are avoided. The rolls can be connected at any time by a clutch, but are thrown out again after half a revolution. In all machines having rolls above 6 inches diameter the rolls are raised and lowered by a screw worked by bevel-gears driven by hand-wheels on outside of housings as shown in cut. Rolls of 6 inches diameter or less are raised and lowered by a screw worked by hand-wheels placed beneath the bearings. The pulleys are arranged with the tight pulley in the middle and loose pulleys on each side, then with an open and crossed belt the rolls can be run either way.

The Russell Oil-Burner.

An oil-burner has been perfected by H. T. Russell, president of the Union Drop Forge Company, 64 to 70 Ohio street, Chicago, which is meeting with much favor both for raising steam and operating forge fires. This burner was devised to meet the requirements of his own establishment, but proved so satisfactory in operation and so economical in its consumption of oil that other manufacturers have sought the opportunity to introduce it into their works. The oil is vaporized with a current of either superheated steam or hot air, according to the duty which it is to perform. For firing under boilers steam is used, while in operating forge fires air is employed. The burner is so constructed that the vaporized oil or gas is consumed on the instant of generation, so that there is never a sufficient accumulation of it to cause an explosion. The various parts of the burner work automatically, so that if any part should get out of repair the process of gas generation ceases. In examining the flame under the boilers at these works it was observed that it was perfectly white and clear at the very mouth of the burner.

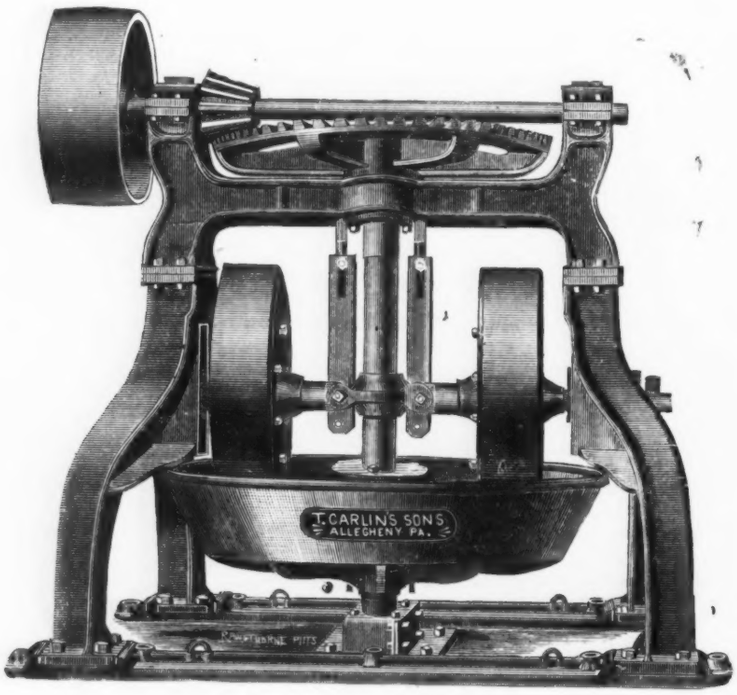
The apparatus used in connection with the forge fires is very simple. The hot air and the crude oil are admitted at the same time into a small chamber, the air being heated by the forge itself and forced into the chamber at a pressure of 7 pounds, while the oil is delivered by gravity. The hot air instantly vaporizes the oil and a gas is generated which gives off a most intense heat when ignited, having been tested up to 4000°. Wrought iron and steel are easily melted when the flame is given full play. It requires but two minutes for the blast to reach a maximum of heat. The flame produced under the boiler is of a different character, owing to the use of steam instead of air as a vaporizing agent. It rolls noiselessly through the fire-chambers, which it completely fills, evenly heating all the exposed parts of the boiler. The oil is stored under-ground as a precaution against fire. A tank was sunk capable of holding 60 barrels and was covered over with several feet of earth, leaving only a man-hole exposed, having an iron cap. A ventilating-pipe passes up from the tank and is carried through the roof of the shed covering this part of the works, which is a good distance from the boiler-house or forges. A small elevated tank made of boiler-iron is provided, into which sufficient oil is pumped from the storage-tank for a day's supply for the works. It has an overflow-pipe running back to the main tank and a ventilating-pipe extending up through the shed roof. Whenever work is suspended for the night all the oil remaining in the elevated tank is drawn off into the storage-tank. Thus the danger from fire is reduced to a minimum. This is the opinion of insurance experts, who carefully examined the arrangements made and finally concluded that no extra charge should be imposed on these works on account of the use of oil for fuel.

The crude petroleum used costs 60 cents per barrel delivered, and the storage-tank and the Russell burner enable two barrels of oil to do the same work formerly done by 1 ton of bituminous coal. The first cost of fuel is thus less, while other advantages are realized from the use of oil over coal, such as the absence of ashes, the regularity of steam supply, less wear on boilers, uninterrupted operation of forge fires, diminished loss on burnt iron or steel, absence of scale to interfere with the work of hammer men, &c. A notable result of the use of oil in forge fires as compared with anthracite coal is the freedom of the forge-room from gas, and consequently the better health of the workmen. The Russell burner has been introduced with success in forges in Pittsburgh in competition with natural gas, as well as in quite a number of establishments in the West.

Nearly 2500 new buildings were erected in Cleveland, Ohio, since January 1, and the aggregate cost of improvements is $4,121,000.

Revolving Dry-Grinding Ore-Pan.

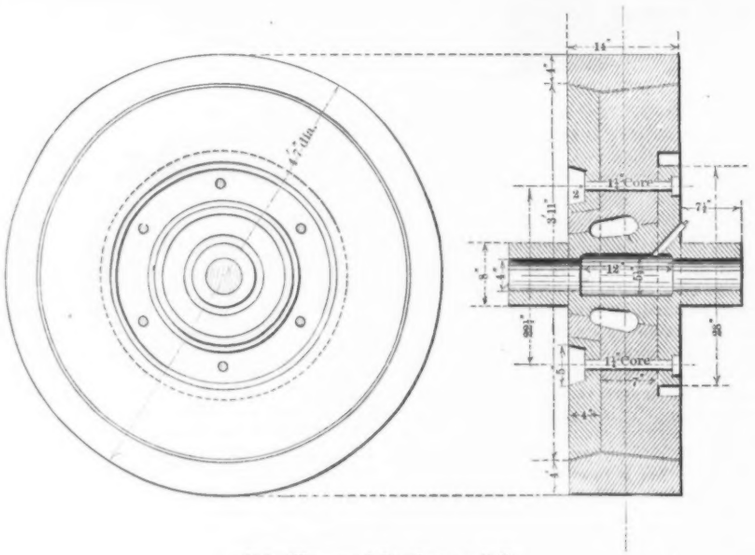
In the ore-pan here illustrated, and which is made by Thomas Carlin's Sons, of Allegheny, Pa., the gearing is overhead, out of the way of possible accident, while the foundation of the machine is so designed as to permit free examination and lubrication. The self-raising device allows quick repairs to be made underneath, as to change toe or plate a lift of but ¼ inch is required, and this is done from above by one man. The top cross-piece of the iron frame forms the bearings for the pinion-shaft, as well as the top bearing of the vertical pan-shaft, assuring perfect alignment. Adjustment on the vertical shaft is made as follows: The center hole in the cross-piece is bored tapering (the large end down) and a split gland is turned to fit the taper and is babbitted to fit the shaft, and is closed on the shaft by forcing it into the tapering hole with the bolts underneath, as shown in the cut. The pinion-shaft is wrought-iron, the roll-shafts and the vertical pan shaft of hammered steel. All lateral motion of the roll-shafts is taken up by the rolls themselves, and is not thrown upon the iron frame, its duty being merely that of carrying the driving-gear and any attending strains arising from them.



REVOLVING DRY-GRINDING ORE-PAN.

The rolls, one of which is shown in section, are made of a diameter, weight and width of face to suit the material to be ground. They have loose tires and bushings, the bearings are extra long and lubrication is amply provided for. Their essential feature is in the design of the inner surface of the tire, which is in the form of a wedge which is clamped by the roll center, which is formed in two parts held by means of bolts passing through the bushing. It is claimed that this form of tire allows them to be worn much closer than is possible with any other roll, and the means of securing them to the roll allows of their quick removal when worn, which is superior to the present way of securing the tires to the rolls by iron and wood wedges, which require the breaking off of the tires when replacing.

The pan proper is cast in one piece, bored to fit its shaft, to which it is firmly keyed. It is provided with a false bottom and false side lining, which can be easily removed, no bolts being required to hold them in place. The pan is thus relieved of objectionable seepage through the bottom which would occur if they were secured by bolts. The pan is provided with base-plates to which the iron housings are fitted. It is claimed that as these pans (which are built in sizes from 6 to 9 feet inclusive) are made wholly of iron and steel and capable of carrying heavier rolls than any other machine made, the output will be correspondingly greater.



Side View and Section of Roll.

The recent statement issued by the Chilian Bureau of Statistics in Santiago gives the population of the republic as 2,665,926. The Indian population is estimated at 50,000. To the actual census returns as above the bureau adds 15 per cent. to cover omissions.

The Through-Rate Problem.

The New York Board of Trade and Transportation have, through their counsel, Mr. John D. Kernan, filed a complaint with the Interstate Commerce Commission against certain railroad companies, charging that the roads are so cutting their regular tariff rates on through bills of lading as to discriminate against the sea-board ports and to allow in some instances a lower through rate on merchandise from Liverpool, for example, to Chicago than the published tariff from Philadelphia to Chicago calls for. The roads against which the charges are made are the Pennsylvania Railroad Company, the Pittsburgh, Fort Wayne and Chicago, and the Pittsburgh, Cincinnati and St. Louis railroads, and copies of the complaint have been duly served upon them by the Interstate Commission.

The complaint cites the following definite cases, showing the rates charged per 100 pounds, &c., in cases where imports were carried by the American Line to Philadelphia:

LIVERPOOL TO CHICAGO.

Goods.	Through rate. Cents.	Rail and ocean to Philadelphia Cents.	Inland, Philadelphia to Chicago. Cents.	Tariff—Philadelphia to Chicago. Cents.
Anvils	29.47	8 42	21.05	33
Anvils.. ..	26.79	8 42	18.37	33
Tin plate, c. 1.....	24	8	16	28

The Pennsylvania Railroad Company, the complaint continues, practice unjust discriminations, in connection with the other defendants, in such a way as to make full ascertainment of the facts involved very difficult, and therefore the complainants ask that the Board shall cause a full discovery thereof to be made.

The pile of silver in the storage-vault in Washington City is increasing at such a rapid rate that more room will be necessary before long. At present the minimum amount, $2,000,000 a month, is coined, but as the silver men are determined to force legislation in an effort to get free coinage, it is thought that a compromise will be made by directing that the maximum amount authorized by the present law, or $4,000,000 a month, be coined. In that case more vault-room would be required immediately.

A new industry in New York is the rousing of mechanics from their slumbers in season to go to work.

THE WEEK.

Speaking of recent sales of iron lands in the Lake Superior country the Duluth *Herald* says: "With one exception the largest deal ever made on the Vermilion, and that exception was the transfer of the Minnesota properties and the Duluth and Iron Range road, is now practically closed. All the necessary papers have been deposited in banks, and the details of the affair are practically settled. Money has been paid on the transaction, and it only remains for a few minor details to be carried out and one or two knotty legal points as to land ownership to be settled to make this trade an accomplished fact. It will transfer from a Duluth firm to a foreign corporation a vast acreage of Vermilion lands, much of it known to be very rich in ore, much of which, indeed, has been examined and tested. It will probably insure to Duluth the building of a second road to the region east of Tower and the establishment of large ore docks here."

The Emigration Commissioners are expecting to be legislated out of office by a bill for the action of Congress prepared by John I. Davenport providing for a Federal commission. The chief commissioner, with headquarters in New York, will have entire control, while minor commissioners will take charge of ports of less importance along the Atlantic Coast. The institutions on Ward's Island are included in the operation of the bill.

The system of employing prison labor in this State, as enforced under the new law, is favorably spoken of by Superintendent Lathrop, although the many restrictions required are a serious embarrassment. For example, the law provides that "the total number of prisoners employed at one time in manufacturing one kind of goods which are manufactured elsewhere in the State shall not exceed 5 per cent. of the number of all persons within the State employed in the manufacture of the same kind of goods." The law also provides that "not more than 100 prisoners shall be employed in all the prisons of the State in the manufacture of stoves and iron hollow-ware, and not more than 100 prisoners shall be employed in all the prisons of the State in the manufacture of boots and shoes." These restrictions have made it necessary to introduce new industries, but of the 3700 convicts now in the three State prisons less than 500 are at present idle. Over 100 men are employed on hollow-ware, and it is expected that many of the men will master trades.

Latest details respecting the fire in Lynn show that the shoe and leather industry suffered to the extent of $2,126,000. Ready-made goods comprised 12,500 cases, valued at $750,000, and shoe machinery valued at $266,400 was destroyed. In addition there were large accumulations of leather and shoe materials.

The river fire-boats again proved efficient in saving the Newburg steamer from entire destruction.

The New York Chamber of Commerce adopted a resolution requesting the President of the United States to enter into negotiations with the Government of China for the restoration of cordial relations between the two countries, and by implication condemning the Chinese Exclusion act of the last Congress.

Chief Engineer Greene, of the Dock Department, having been severely reflected upon in the examination of witnesses testifying before the Commissioners of Accounts, invites a full investigation of his official career. The principal disclosures thus far indicate looseness in the manner of leasing wharves and piers, if not downright corruption and bribery, and there are indications of crooked work in the matter of dredging, public money seeming to have been squandered. Mayor Grant is expected to take summary action.

St. Louis papers say that fire-proof structures are popular in that city and are good-paying properties. At the office of the Board of Underwriters it was stated that insurance rates for this class of structures are 50 per cent. less than those for the standard building conforming to the laws.

The Argentine Congress since the commencement of the present session has approved of five or six schemes or projects for the construction of fast-sailing steamships for lines between Europe and the Plate, to be convertible into cruisers, fully armed for the Government. The steamers are to sail 19 miles an hour and have triple or quadruple expansion-engines. Kohn, Reinach & Co., of Paris, will run five steamers on a contract for ten years, the State to guarantee 4 per cent. on a capital of $8,000,000, gold.

In a suit for infringement of patent brought against the Winona Harvester Works by William Deering, Judge Nelson, of the United States Circuit Court in St. Paul, decided that the complainant was entitled to a decree as to the Knotter patents Nos. 278,639 and 301,190, and so ordered.

Rifle-bullets are now photographed in their flight, together with the atmospheric effects, thus permitting a selection of the form of ball that has the least resistance.

Spreckels, who has commenced unloading raw sugar for his new refinery in Philadelphia, discovers that his first conflict is not with the trust, but with the local stevedores, who claim the right to discharge vessels at that port, regardless of the experienced men from the Pacific Coast who accompany Mr. Spreckels for the management of his business.

New axles, square instead of round, have been placed on the 64 cars in use on the Brooklyn Bridge. Superintendent Martin found, upon examination of the pieces of the axle that broke on Tuesday, that the break occurred where the axle had been turned down to receive the clamp connected with the piston of the pump which supplies air for the brakes. President Howell thinks the square axles will prove the stronger, because they need not be pared to receive the clamps.

Gen. S. V. Benet, Chief of the Ordnance Department, and Capt. Charles P. Smith, United States Army, of Washington, last week made their first visit to the works of the Bethlehem Iron Company for the purpose of noting the progress being made on the Government contracts, with which they expressed themselves as being thoroughly satisfied.

Rear Admiral Gherardi, who lately visited Hayti, has great confidence in the future of that republic and the productive capacity of the island. The coffee tree is indigenous and its seeds are scattered by the winds and birds. Of the exports coffee comprises 75 per cent., yielding a revenue to the Government of more than $2,000,000 per annum in gold. If protected from revolution exports would largely increase. Admiral Gherardi says: "Now, we want to extend our commercial relations with Hayti, or we shall lose what trade we now have with her. We have no such thing as banking facilities, but must do all of our business through a foreign corporation, to which we pay a big revenue. There is, practically, only one banking house in Hayti, a French bank at Port-au-Prince. Its power with the Government is tremendous. It stands in the position to Hayti that the Bank of England does to England. It has agents in every town, collects all the revenues, pays out on drafts from the treasurer and charges big fees for so doing."

The many entanglements arising from the Interstate Commerce law seem to call for some recognition by Congress, particularly as concerns the rivalry of Canadian routes. It is therefore remarked as singular that the recommendations of the President's message contain no reference to the subject. The commissioners have practically admitted that the questions involved were beyond the scope of their jurisdiction. It remains to be seen how or by what means the Canadian roads can be influenced to harmonize their policy with that of the American roads. Neither is it apparent to what extent the latter should observe in a literal sense the requirements of the law with reference to the competition of foreign lines. The endeavor to make the law apply to traffic not "under similar circumstances and conditions" is a fruitful source of embarrassment. Possibly the whole subject is in abeyance pending a reorganization of the commission.

The construction of 18 new vessels of war of various classes are provided for by Senator Hale's bill introduced into Congress 5th inst. The President is authorized to have constructed by contract eight battle-ships of 7500 to 10,000 tons displacement, two armored coast-defense vessels, three gun-boats of 800 to 1200 tons and five first-class torpedo-boats. Discretion is given to the Secretary of the Navy in the matter of premiums to be allowed for speed in excess of contract requirements. The Secretary may build the vessels at the navy-yards in case he cannot contract for them at a reasonable price.

The beet crop, according to M. Licht's report of November 16, is for 1889 and 1890 3,330,000 tons, including productions as follows: Of Germany, 1,750,000 tons; Austria, 720,000; France, 650,000; Russia, 490,000; Belgium, 180,000; Holland, 55,000; other countries, 60,000. The total production in 1888–89 was 2,764,457 tons; in 1887–88, 2,451,950 tons.

The new steamship China of the Pacific Mail Line arrived at San Francisco on the 6th inst. in 12 days and 18 hours from Yokohama, breaking the record. She was built at Govan-on-Clyde and is 406 feet long, 48 feet beam and 36 feet in the hold.

It is announced that the Farmers' and Laborers' Union, lately in session in St. Louis, have absorbed the National Farmers' Alliance and the Farmers' Mutual Benefit Association. The consolidated organization, with an estimated membership of 2,250,000, elected as president L. L. Polk, of North Carolina. Master Workman Powderly in an address attempted to demonstrate the identity of interests existing between the farmers and wage-workers.

A wrapping-paper trust is spoken of as probable, its headquarters to be in Chicago. The mills number over 1000, and some of them make 60 tons of straw or rag wrapping-paper every day.

Since 1882 there have been organized in the Argentine Republic seven joint stock companies having a capital of over $20,000,000 each; 13 with a capital of $10,000,000 to $20,000,000 each; 20 with a capital of $5,000,000 to $10,000,000 each; 54 with a capital of $1,000,000 to $5,000,000 each; 24 with a capital of $500,000 to $1,000,000 each, and 46 with a capital of not less than $500,000, a total of 164 companies with a combined capital of $596,500,000. Mr. Mulhall, of the Buenos Ayres Standard,

alludes to this as the joint stock company mania. Mr. Mulhall says that in a majority of the above companies the capital is not yet paid up, but is being called monthly in 10 and 15 per cent. installments, making a serious drain upon the money market. He considers a crisis in these concerns not far off.

The success of sorghum-sugar manufacture in Kansas is as yet problematical. Judge Parkinson, the father of the industry, says about 1,500,000 pounds have been made this year, the principal works at Fort Scott turning out 350,000 pounds, exclusive of 100,000 gallons of molasses, but the profit cannot be known until the product is sold. More factories will be built next year and some of the new ones will be enlarged, so that the output of sugar in 1890 will be at least double that of the season just closing.

The estimated cotton crop of the State of Texas this year is 1,337,000 bales. This only falls about 200,000 bales short of the whole cotton crop of India. Truly, Texas is a grand State.

A description of the new Croton aqueduct, given in the *Century*, helps to give some idea of the magnitude of the work by comparing it with railroad tunnels. It is slightly smaller in diameter than these tunnels, but very much longer. The Hoosac Tunnel is 24,000 feet long, the Mont Cenis 8 miles long, the St. Gothard 9½ miles, while the new Croton aqueduct will be nearly 30 miles long. It is a very much greater work in every way than the old Roman aqueducts about which so much has been written, but less is heard of it because it has been built in this day of great things.

Buenos Ayres has a population of 433,375, having increased more than 250,000 in the last 20 years.

In reference to the various measures proposed for the restoration of our merchant marine ex-Secretary Hugh M'Culloch represents a widely prevalent feeling when he says: "As more than half a century ago I thought that incidental protection was needed to induce capitalists to put their money into manufactories, so now I think that aid from the Government is imperatively required to secure the rebuilding of merchantmen for the foreign trade; the aid to be rendered by direct subsidies or by liberal compensation for carrying the mails The latter would be preferable and might be sufficient. But so important do I regard the revival of our shipping interest, prostrated as that interest was by the substitution of iron for wood in the construction of ships and the civil war, that if I were a member of Congress I would vote for any measure that I might regard as being necessary to effect it."

The opening of the Poughkeepsie Bridge is having a revolutionary effect in the coal trade throughout New England, even beyond expectations. According to report, hard coal has, within the last few days, been sold in Eastern Massachusetts for from 25 to 50 cents less than before the Poughkeepsie Bridge was opened, which reduction may mean that a goodly portion of the coal that now comes to Philadelphia and New York for distribution by vessel will be carried straight over the Poughkeepsie route from the mines and be shuted into New England yards from the same cars that received it at the collieries. Anthracite coal is being sold at such points as Lowell and Lawrence, not far from Boston, at from 25 to 75 cents less than the rate possible by water shipment. The same coal is sold to a like advantage at Worcester, Springfield, Chicopee, even in Connecticut, and as far north as New Hampshire and Vermont points. This is not all coal that has passed over the Poughkeepsie Bridge, for the opening of the latter has forced concessions from the New York and New England Railroad, which ferries coal across the Hudson River at Newburg and so practically offers a through rail route. It is said that soft coal can go by the bridge route as well as hard coal, and since between 4,000,000 and 5,000,000 tons of this fuel are consumed east of the Hudson River the magnitude of the change can be imagined.

The extraordinary amount of exports from the United States during October, exceeding in value $100,000,000—a circumstance not paralleled before in any single month for the last ten years—gives much interest to the statement of exports of produce from the port of New York since January 1. The principal items are as follows, compared with the last two years:

	1887.	1888.	1889
Cotton, bales.....	732,022	891,349	938,350
Wheat flour, bbls.	4,645,320	4,334,520	3,812,899
Wheat, bush.....	39,693,761	12,092,805	9,749,933
Corn, bush	11,777,539	11,677,155	27,923,352
Petroleum, galls.	30	340,577,703	399,285,617
Pork, bbls.....	51	146,885	183,092
Beef, bbls	65,636	72,818	95,840
Cut meats, lbs...	212,330,770	171,396,160	240,326,019
Lard, pounds....	175,824,657	153,824,913	234,528,366

The grain trade is divided principally with Baltimore.

The bridge-builders in Cleveland have been much embarrassed by the scant supply of iron beams and girders, and they are now endeavoring to formulate plans to secure more favorable prices as well as more abundant material.

A new feature in finance is the introduction in New York of an organization said to represent $100,000,000 of English capital, whose principal function will be to provide credit for new American railroad projects. It will be what is technically known as a "financiering" company, acting upon principles and along lines long recognized in the English financial world; its "risks" will be railway mortgages. It will be a guarantee company; it will indorse railway credit. The promoters of this scheme claim that "it means a great widening of opportunities for new projects which have been held back—practically suppressed—by the bankers' combine. It means that plans of development can get support at once instead of being held back and crowded down till existing properties shall have grown supremely rich as monopolists of railway investment." The management will be American.

The valuation of Boston has been raised this year from $764,000,000 to $795,000,000, an increase of $31,000,000.

The American Meat Company, organized some months ago with much trumpeting, are said to have collapsed owing to some differences with Mr. Armour, of Chicago, and the resignation of ex-Senator Warner Miller from the presidency.

A glass telephone is working successfully in Boston. It consists of a diaphragm or transmitter of glass resting on a number of glass rods, and these communicating with an ordinary wire sound is thus transmitted by the vibration of glass, and with peculiar intensity.

The price of cotton rags is finding a lower bottom, year after year. Meanwhile wood-pulp is booming.

The New York canals have had a profitable season, the first for several years. The rates of freight have been steadily maintained on a paying basis and the use of steam propulsion has been advantageous. The old double-header horse-boat makes the round trip from Buffalo to New York in about four weeks. The steamer saves much in time. But the adding of boat to boat, all in a single tow and managed by a single crew, is what has made steam especially valuable. If a steamer has one consort she pushes it; if two she tows them; if three she tows two and pushes one. Such a tow as the last can earn nearly $2000 gross on a round trip. The reason that they do not become more popular is because, as a rule, the men who follow the canal are not capitalists. Horse-boats cost from $2500 to $3500; the sort of steam tow mentioned above costs $18,500. During the season the boats brought into Buffalo 26,500 tons of pig-iron, 6500 tons of iron and steel, 100,000 tons of coal, and they shipped eastward 37,000,000 bushels of corn and wheat.

The season's record of business on the Sault Ste. Marie Canal is as follows compared with last year: Passages, 9579, against 7803; registered tonnage, 7,231,035, against 5,130,659; freight tonnage, 7,516,022, against 6,411,423. The gain is about 20 per cent. in passengers and 18 per cent. in freight tonnage.

The rapidity of the growth of New York City is illustrated by the fact that when some of the city officials visited the annexed district the other day they found a street before unknown, which had never been authorized or opened, and yet had been built up with 50 or more houses.

The chief trouble between the glass manufacturers of Pennsylvania and the Knights of Labor has been a difference of opinion respecting the number of apprentices that may be employed. One of the master workmen, referring to a meeting held last week at the Continental Hotel, in Philadelphia, said: "We have always held, and we still maintain, that we are right in the stand that we have taken. The system proposed by the manufacturers in regulating the apprentice question is one that keeps a great many men out of employment. We have a membership in the combined districts of more than 2035, and we allow 534 apprentices. The flint-glass workers have a membership of nearly 5000 and they only permit the manufacturers to engage less than 300 apprentices, while the window-glass men do not allow their managers to engage any at all, excepting where they will benefit the journeymen. Now, then, you can see that although the manufacturers' association are continually opposing us, we are more liberal to our employers than any other department of the trade."

Ex-Mayor Edson, Hugh N. Camp and others have formed a company to build an electric railroad eight miles in length between Fordham Heights and Tremont. The capital is $200,000.

A fire in the iron pier shed of the National Steamship Company, on the North River side, destroyed a large quantity of valuable merchandise, and the building itself was wrecked, showing the danger to which property on the water-front is exposed, even under the most favorable conditions. So rapid was the progress of the flames that five men in the lofts were suffocated before they could escape. The fire is supposed to have originated in a lot of 600 bales of cotton, and although a dozen chemical extinguishers were at hand and 1800 feet of hose, with boiler and engine securely housed, all precautions were unavailing. Even the storehouse was incased with corrugated iron and the building throughout, excepting the wooden flooring, was nominally incombustible. The damage to the structure is estimated at $60,000 and the value of the goods was as much more.

The idea of opening immense showrooms in Buenos Ayres in which to exhibit articles of American manufacture was conceived by the leading member of a prominent Spanish commission firm in New York, and Señor Acevedo, who is familiar with South American countries, was chosen as a representative of the Pan-American Congress to carry out the enterprise.

MANUFACTURING.

Iron and Steel.

The blast-furnace of Andrews Brothers & Co., at Haselton, Ohio, which has been undergoing repairs for some time, was blown in on the 25th ult. It is expected to turn out about 200 tons per day. About $75,000 worth of improvements have been made on the furnace during the past six months. It is now 75 x 19 feet, with three 75 x 18 Cowper-Kennedy stoves. The firm use in their rolling-mill about 100 tons of iron per day.

The W. Dewees Wood Company, of McKeesport, Pa., manufacturers of patent planished sheet-iron, are erecting an open-hearth steel plant for the manufacture of steel slabs.

The blast-furnace of the Norton Iron Works, at Ashland, Ky., after being relined and otherwise repaired, was blown in last week and has resumed the manufacture of Norton American Scotch pig-iron, used for softeners. Rogers, Brown & Co., Cincinnati, Chicago and Buffalo, and Rogers, Brown & Meacham, of St. Louis, are the sales agents.

Horace W. Lash, general superintendent of the Carbon Iron Company, of Pittsburgh, under date of the 5th inst., writes us as follows: "We have contracted for two additional 30-ton open-hearth furnaces; also a number of other improvements in the way of our reducing-furnace plant and increased heating and rolling capacity, which will more than double our present output about the 1st of March."

The rolling-mill of the Stewart Iron Company, Limited, at Sharon, Pa., which has been idle for more than a year, was put in operation this week. The mill contains 15 single puddling-furnaces, 2 heating-furnaces, 2 hammers and 2 trains of 3-high 18-inch rolls, and has a capacity of about 9000 net tons per year. The two blast-furnaces of this company are also in successful operation.

A meeting of the creditors of Long & Co., proprietors of the Vulcan Forge and Iron Works, at Pittsburgh, was held in that city last week. A statement was presented by the firm, showing that the liabilities were $525,000 and the assets $543,000. It was expected that an arrangement would be made with the creditors by which the firm would be enabled to put the plant in operation. This was not done, however, and the entire works will be offered for sale by the sheriff on Thursday, the 12th inst. The Dollar Savings Bank, of Pittsburgh, holds a mortgage for $70,000 against the property, and the Lawrence Bank, also of that city, holds judgment notes of the firm to the amount of about $300,000.

A number of capitalists of Pittsburgh are perfecting the formation of a new steel company, to be known as the Kingsland Steel Company. A final meeting will be held during the present week, at which it is expected that some definite action will be taken looking to the selection of a site and possibly the awarding of contracts for the erection of the works. It is reported that the new concern will have a capital stock of $1,000,000, considerable of which has already been subscribed.

The East Pennsylvania Furnaces, situated at Lyons, Pa., and owned by the Reading Railroad Company, are to be demolished and the material used in the repair of other furnaces. They were built 16 years ago and were started up twice, but never proved successful.

On the 4th inst. the Greensburg Steel Company, of Greensburg, Pa., with a capital of $100,000, were granted a charter. The plant of the firm will be located at Huff Station, about two miles from Greensburg. John Kuhns is president, J. Clark Williams secretary and James C. Clarke, president of the Greensburg Banking Company, is treasurer.

The plant of the Allegheny Bessemer Steel Company, at Duquesne, Pa., is at present turning out about 500 tons of steel rails per day, but when the improvements now being made by the company are completed they will be able to produce about 900 tons of rails per day. The two converters now in use have a capacity of 5 tons each. These are to be changed for vessels of 7½ tons each. The 8-foot cupolas are to be replaced by 10-foot cupolas. This will increase the melting capacity to an amount corresponding with the size of the new vessels. In addition to these improvements, four new boilers are to be added. A new soaking-pit in the blooming-mill is about completed.

East Birmingham, Ala., is probably to be the location of a furnace contemplated by J. C. Kyle, J. M. Crowder and G. L. Morris.

Stein & Schwarz, of Philadelphia, have been awarded the contract for building the furnace of the Vanderbilt Steel and Iron Company, at East Birmingham, Ala.

The North Carolina Steel and Iron Company have been organized at Salisbury, N. C., to mine Bessemer magnetites at Old Hill, on the line of the Cape Fear and Yadkin Valley Railroad, 40 miles from Greensboro, N. C. A furnace is to be built at the latter point and a steel plant and rail-mill are to follow. The following are the officers of the company: James A. Odell, president; J. J. Newman, vice-president and general manager; Samuel H. Wiley, secretary and treasurer.

The Bay State Furnace Company is a concern recently organized to build a furnace at Fort Payne, Ala.

The Condit-Fuller Company, of Cleveland, Ohio, has been incorporated, with a capital of $10,000. The company will engage in the manufacture and sale of iron, iron ore and steel.

Mr. Arthur, of Middlesborough, Ky., sends us the following dispatch: "The directors of the Middlesborough Iron Company entered into an agreement with a gentleman from London, England, representing $1,000,000 capital, which he proposes to invest in the erection of iron-works and a basic steel plant with a capacity of 300 tons per day, at this point. J. R. Witherow, of Pittsburgh, secured the contract for the two iron furnaces now being erected here and is bidding for the contract for the above-mentioned steel plant as well. O. W. Davis, Jr., informs the writer that he will commence work on his charcoal-iron furnace on January 1. A rod-mill, a light-sheet mill and a nail plant are now assured for Middlesborough in addition to the above."

The Katherine Furnace, at Carlisle, Pa., is being remodeled according to plans and specifications by Frank C. Roberts, C.E., Philadelphia and Pittsburgh, Pa.

W. E. McNeilly, secretary and treasurer of the Southern Iron Company, has sent the following particulars of the organization of the company to the *Bulletin* of the American Iron and Steel Association: "It can be officially announced that the company have become the owners of the properties formerly owned by the Warner Iron Company (including the Goodrich plant), the Ætna Iron Company, the La Grange Furnace Company, the Wayne Iron Company's lands, the Drouillard Iron Company and the two West Nashville furnaces, all in Tennessee; the Attala Furnace Company, in Alabama, and the steel plant and rail mill of the Roane Iron Company, at Chattanooga, Tenn. The company now have eight blast-furnaces, and the ninth one is being built at Allen's Creek. The Southern Iron Company are an Alabama corporation. The officers so far elected are: Nathaniel Baxter, Jr., president, and W. E. McNeilly, secretary and treasurer. The other officers are yet to be chosen. The commercial and financial office of the company will be at Nashville, Tenn., and their legal home in Alabama, at Huntsville. They are operating under a special charter granted by the State of Alabama." It is understood that one of the objects of the new organization is the manufacture of Bessemer steel by either the acid or the basic process, but most likely by the latter process.

No. 2 stack of the Keystone Furnace, operated by the Reading Iron Company, will be ready to blow in February 1 with an increase in capacity of 100 per cent., due to extensive general repairs and the raising of the stack to a total hight of 65 feet. No 1 blew out on the 2d inst, after a successful run of three years, and will be remodeled to correspond with No. 2. The latter will probably resume operations about March 1, when it is expected that the output of the two stacks will aggregate between 150 and 175 tons per day.

The Bristol Iron and Steel Company, of Bristol, Tenn., have closed a contract to build a blast-furnace at that point. The company include Samuel Dickson, president of the Crane Iron Company; Abraham S. Patterson, president of the Pulaski Iron Company; Cumley B. Shumaker, president of the Warwick Iron Company; William H. Trotter, Justice Cox, Jr., and Edward Cook, manager of the Pottstown Furnace.

The Southern Iron Company will put up two basic open-hearth steel furnaces in the mill of the Roane Iron Company, at Chattanooga, Tenn.

It is reported that R. & A. Heckscher, who operate the Swede Furnace, are negotiating with the Merion Iron Company to lease the Merion Furnace, at West Conshohocken, Pa.

An engine for rolling steel rails, believed to be the largest ever made for the purpose, is being erected at the works of the Palmer Ship Building Company, Jarrow, Newcastle. It has two cylinders of 6 feet stroke, and when working up to its full speed is capable of exerting 10,600 horse-power. The crank-shaft is 21 inches in diameter and the forging for this shaft weighed over 40 tons. The weight of the entire engine is about 300 tons.

The addition now being erected to the Chrome Steel Works, of Brooklyn, will cover the remainder of the frontage on Kent avenue, between Keap and Hooper streets, and will extend back 204 feet. There has been added to their plant a tubular boiler and one horizontal and one vertical engine.

The Pittsburgh Bridge Company, of Pittsburgh, have secured the contract for the erection of a superstructure of the new bridge across the Duck River, at Columbus, Tenn.

At a meeting held in Pittsburgh on Tuesday, the 3d inst., the Novelty Steel Wheel Company, of McKeesport, Pa., elected officers for the ensuing year. William Hartman was elected president, James L. DeLong treasurer and Mr. Clark secretary.

The furnace men in the Shenango Valley, Pennsylvania, having recently been granted an increase in wages, they are now being paid as follows: Laborers, per day, $1.45; keepers, per day, $2.40; fillers, per

day, $1.90; top fillers per day, $2.15; cinder snappers, per day, $1.75; metal carriers, per ton, 14¾c.

The National Tube Works Company, of McKeesport, Pa., are about to commence the erection of an extensive warehouse at that place for the purpose of storing tubing.

Andrew Lennox, of Allegheny City, Pa., is building one heating-furnace and one open-hearth steel-melting furnace, of the Smith type, for Jennings Brothers & Co., on Preble avenue, Allegheny City. Mr. Lennox has arranged with M. V. Smith to build his system of furnaces by contract. Prior to this Mr. Smith held the business in his own hands—furnishing drawings and engineers to superintend the construction of his furnaces. Mr. Lennox is a contractor and builder of regenerative gas-furnaces.

An explosion of gas threw out of its position the downcomer of the blast-furnace of the Pottstown Iron Company, at Pottstown, Pa., which had just been blown in.

On Monday, December 2, the Scranton Steel Company, at Scranton, Pa., again beat their record. During the night turn the Bessemer department in 73 heats made 501 tons of ingots.

The Pennsylvania Steel Company, at Steelton, Pa., are building an additional blowing-engine for one of their Bessemer plants.

Machinery.

The Clyde Iron Works, of Duluth, Minn., will in a few days begin work on two extensions, one on the north of the present main building and one on the south, the first to be used as an addition to the machine-shop, the second as part of the foundry. By spring the building will have a frontage of 113½ feet on Lake avenue, running back the entire depth of the lot. In this will be put a lot of new machinery.

Handson & Robbins are in the Admiralty Court to recover $32,500 for repairing the British steamer Vertumnus. This firm have taken the contract to repair or rebuild the steam-ship Atlas, sunk in the North River last winter.

Negotiations have been closed for the purchase of the old Union Bolt Works property, in Paterson, N. J., by Mayor Nathan Barnert, and it is understood that W. W. Evans, now superintendent of the Grant Locomotive Works, will lease the premises and erect a large foundry and wrought-iron shop.

The extensive Lowell Iron Foundry, at Manchester, N. H., was sold the 5th inst. to Head & Dowst for $50,000, and it is probable that a new industry will be introduced.

The Canton (Ohio) Steam Pump Company have moved into larger and more commodious shops. The company were recently reorganized, the following officers being elected: President, W. Barnett; vice-president and manager, C. M. Miller; treasurer, J. H. McLain; secretary, Charles F. Shaver; superintendent, Edgar E. Miller.

W. B. Pollock & Co., of the Mahoning Boiler Works, Youngstown, Ohio, have a large amount of work on hand and are operating their plant to its full capacity. Last week they received orders for 50 tank-cars, a number of boilers and also for a large amount of plate-work.

The Salem Foundry and Machine Shop, of Salem, Mass., manufacturers of elevators, report business to be very satisfactory, their sales this year being larger than any previous year. Among recent sales may be noted the following: Tremont and Suffolk Mills, Lowell, Mass.; Locke Bros., Salem, Mass.; Great Falls Mfg. Company, Great Falls, N. H., and Wamsutta Mills, New Bedford, Mass. They make a specialty of safety appliances for elevators, including automatic hatches, both sliding and folding, and the Weld Automatic-Lock Gate, which is self-closing and is always locked, excepting when the car is at the landing.

The Newark Machine Tool Works, of Newark, N. J., have just issued a circular of their new horizontal drilling and boring machines. The introduction to the circular points out the fact that with a lathe even slightly out of true it is impossible to bore a true hole, since the inaccuracies in the lathe are reproduced in the work. Further, when boring in a lathe a bar is required of a length not less than twice the length of the work. These disadvantages, in addition to others, have led to the adoption of the horizontal boring-mills. These machines, as constructed by the above company, are fully described in the circular referred to.

The Ætna Machine Company, of Warren, Ohio, recently closed a contract with Ralph J. Wick, treasurer of the Lancaster Iron Company, Lancaster, Pa., for a 600 horse-power engine for their new plant. In July, 1888, the Ætna Company sold to the same gentleman a 500 horse-power engine for the Hubbard Iron Company, Hubbard, Ohio. This being the second one sold to the same party, it speaks well for the merits of the engine. The engine sold in 1888 has been running constantly night and day ever since it was placed in position.

From the Hooker-Colville Steam Pump Company, of St. Louis, Mo., we have received a catalogue describing and illustrating the Hooker steam-pumps, and also giving the prices of the several sizes made. The pumps built by this company include the following: For feeding boilers and pumping gritty or muddy water, for heavy pressure, for mines and heavy work, double-acting plunger sinking-pump, tank-pump, pump and boiler combined, vertical artesian-well engine, vertical double-acting deep-well pump, &c.

Hardware.

Articles of incorporation for the Harbor Ship Chandlery Company, Cleveland, Ohio, have been filed at Columbus; capital, $10,000.

Perkins Bros., Bridgewater, Mass., have in process of erection a wire-mill, which will be ready to start about February 1. The product of this mill will be used in their wire-nail factory.

Hussey, Binns & Co., Limited, the well-known Shovel manufacturers, of Pittsburgh, will remove their plant to Jeanette some time next year. The plans for the new buildings are about completed. These buildings will be three in number and built of brick and stone, with corrugated-iron roofs. The size of the buildings will be 200 x 80, 225 x 90 and 275 x 90. The firm have for a long time felt the need of more room for their works, and as there was no chance to enlarge at their present location they decided to go elsewhere. Another great inducement is the lower rate of taxation and cheap gas fuel; their property being adjacent to the Grapeville belt they are assured of a gas supply for a number of years, as 1 pound pressure is sufficient to run their works, but would not carry gas to Pittsburgh. As their busy season will continue until late in the spring, they have decided not to make the removal until the summer.

The Joliet Mfg. Company's extensive works at Joliet, Ill., were destroyed by fire on the 10th inst. Loss about $35,000; well insured. The company were engaged in the manufacture of corn-shellers, cultivators, corn-planters and barbed wire.

Miscellaneous.

Among the new corporations of Illinois which have been licensed during the past week are the following: Dodson Safety Nut-Lock Company, at East St. Louis; to manufacture a nut-lock for railroad use; capital stock, $500,000; incorporators, James T. Dodson, Benajah White and W. C. Eyster. American Roller Bearing Company, at Chicago; to manufacture and sell roller-bearings; capital stock, $1,000,000; incorporators, Herman Haupt, Jr., T. E. Shacke and E. D. Agle. Joliet Wheel Company, at Joliet; to manufacture bicycles, &c.; capital stock, $25,000; incorporators, R. G. Surbridge, B. F. Hicks and Fred Bennitt. Peerless Lamp Bracket Company, at Chicago; to manufacture a lamp-bracket; capital stock, $5000; incorporators, Frank Wheaton, Martha R. Stimson and L. E. Bontz. Schenck Mfg. Company, at Chicago; to deal in hardware specialties; capital stock, $5000; incorporators, C. O'Colligan, Jr., John O'Donnell and W. D Coppernoll. New Era Gas Fuel Appliance Company, at Chicago; to manufacture and sell gas, gas-burners and other gas appliances; capital stock, $200,000; incorporators, W. C. Thayer, H. L. Kendall and Josiah Burnham. Colby Testing Machine Mfg. Company, at Chicago; for a machine business; capital stock, $100,000; incorporators, D. Hogg, A. D. Hannah and E. J. Colby. The Fox Solid Pressed Steel Company filed a certificate of increase of capital stock from $750,000 to $1,000,000.

It is reported that an aluminium factory is to be established at Ohiopyle, Fayette County, Pa., by D. Shriver Stewart, of Washington, D. C., and W. T. Bernard, of New York, and others.

From the Magnolia Anti-Friction Metal Company we have received a copy of a letter from R. L. Peck, chief engineer of the steamer Owego, in which he makes the following statement: "The Magnolia metal was used in low-pressure crank-pin brasses 14 inches diameter, 16 inches long. Your metal was placed at quite a disadvantage. Post's Zero had melted out the first trip used in this bearing; was in a great hurry and did not have time to run the Magnolia metal as I should like to have done. The first trip to Buffalo, August 1, intentionally let the bearings run loose and then there was a great deal of pounding. Took this precaution because Post's metal had melted. Expected to see the Magnolia metal all used up, upon examination in Buffalo, but was surprised and gratified upon the examination. Keyed the brasses up and the chill has not since been off the brasses, although we have encountered weather that would lift the propeller-wheel out of the water. These facts are taken from my log record."

The new catalogue of the Buffalo Forge Company, of Buffalo, N. Y., describes and fully illustrates their hot-blast apparatus for heating and ventilating factories, halls, public buildings, &c., and many drawings are given showing the arrangement of the apparatus of buildings of different kinds. This method of heating and ventilating is finding wide adoption and meeting with the approval of those employing it.

Bradley & Co., of Syracuse, N. Y., have lately fitted up a very elegant show-room containing 6000 square feet of floor-space and in which are displayed some 40 carriages, no two alike. The room is on the same floor as the general offices. It is finished in natural wood, with iron columns and hard-finished floor.

England is glutted with imported cattle and shippers are losing money. Receipts from the United States and Canada are 100,000 head in excess of last year.

The Iron Age

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RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

Prosperity in the Iron Trade.

It may be broadly said, so far as such a general statement is admissible in an industry so varied, that the iron and steel trade is now in an exceptionally prosperous condition. In some lines, indeed, quite extraordinary profits are reaped. In others, manufacturers are now earning the returns which compensate them for years of meager dividends or actual loss. Of course local conditions and the individuality of the management cause such wide differences that anything beyond generalization is impossible. Nor do we in this country possess the guide which the reports of public companies furnish, notably in England and in Germany. Still some data are common property which enable a pretty clear idea to be formed of the returns in certain lines of industry and in certain parts of the country. They allow of the presentation of some general figures at least. Thus Alabama iron-makers, whose statements must be accepted as conclusive, claim to be producing pig-iron for between $9.50 and $10 per ton. Realizing as they do from $14 to $14.50 as the average of the grades, the profit is between $4 and $5 a ton, so that they are earning about $15,000 a month for one furnace, net. The investment of course varies within wide limits, including as it often does large tracts of mineral property far beyond the requirements of the plant. It is known that some of the Virginia enterprises have been paying handsomely even during the depression, and the activity in the building of new plants in certain sections of the State by parties interested in going concerns indicates that the returns have been very encouraging.

In the West the makers of Bessemer pig and in some instances of special grades of foundry iron have a very bright future before them. When Bessemer pig was selling at $16 at furnace and a shade less early in the year, prices were admittedly close to cost. Making the most liberal allowances for increased price of ore, say $1 per ton, for next season, taking into account the advance in coke, in wages and in freights, cost has certainly not risen yet to $19.50. But sales have been made at $24 to $24.50. Accepting the former figure, we have an apparent profit of $4.50 per ton. Modern furnaces come close to a production of 5000 tons per month, which would represent a monthly profit of $22,500.

In the steel branch modern wire-rod mills are generally accorded the distinction to-day of being the best-paying property. The cost of rolling is liberally put at $9 per ton. Added to the cost of billets at buyer's mill of, say, $35, a margin of about $6 per ton is probable. Rolling at the rate of 3500 tons a month, a plant representing an investment of $250,000, including working capital, is earning $21,000 a month.

In other important branches the returns are not exceptionally large, because the price of the finished product has not kept pace quite with the rise in raw material. Based on $23 pig-iron, with an allowance of 15.2 per cent. for waste, $5 for labor and $5.50 for molds, refractories, manganese, repairs and natural gas fuel, soft steel 4 x 4 wire billets would cost $35. The recent heavy advance in Bessemer pig has therefore cut out the profits if sales were to be made at the figures named, using material at present quotations. In the rail trade and in the steel cut-nail business a similar state of affairs exists for those who are dependent upon the open market for their supplies of raw material. The profits of the ore miners for the coming year promise to be unusually large, while the sums earned by the coke producers must at present prices compensate them fully for years of disastrous cutting.

The large returns secured during the past few months and reasonably sure for the first half of 1890 are likely to stimulate new construction and expansion in a remarkable degree. In fact, hardly a day passes without its report of extensive betterments and of new enterprises of magnitude. The South particularly is the scene of feverish activity, from Virginia to Alabama. Some of the figures which we have quoted pale into insignificance beside the profits promised by promoters and town-lot venders. There is every indication that the crop of ventures will be enormous during the next few months, and that there will be a very liberal sprinkling of immature, ill-advised schemes. The trade generally is not likely to waste much sympathy upon those who become victims, but it will regard them with serious misgivings, because the plants, the products of folly and extravagance, remain, a thorn in the flesh to better-planned enterprises, old and new.

In spite of the fact that with modern methods of work it takes far less time to start works after the ground has been broken, few of those now being planned will be able to participate in the fugitive benefits of a brief season of great profits. Over a year is at least required, and past experience teaches that, unfortunately, good years come singly.

Investors who accept as typical balance-sheets based on the operations of going concerns during the past three months or on the promise of the first half of 1890 are doomed to the sharpest disappointment. Enterprises which cannot pay a fair manufacturing profit when prices are on the level which they occupied during the first half of this year are unsound. They will simply swell the number of concerns having a fitful and precarious existence. Unless it can be shown that in ordinary times of fierce competition a plant can deliver to the markets its product at prices close to the cost of the majority of well-situated, well-managed and well-equipped works, capital should shun it. Unfortunately only too many schemes are floated because the first set of buyers of stocks and bonds purchase them without the least idea of holding them as a permanent investment. They propose simply to make a turn.

It is not too much to say that the principal factors in thus far preventing a boom in this country rivaling the advance on the other side of the Atlantic have been the wonderful development of the iron-ore mining industry in the Lake Superior region, the expansion of steel-making plant East and West and the development of pig-iron production in the South during the past three years. Had it not been for these developments we would probably have kept close to the importing point, when now we are in many branches selling as low and even lower than they do in Europe. This, by the way, is a fact which must sorely puzzle those who claim that our duty is added to foreign cost, and figure out how many hundreds of millions of dollars consumers here have poured into the pockets of iron miners and manufacturers.

It is a strange fact, however, that hardly has our demand succeeded in catching up with our greatly expanded productive capacity than we are feverishly at work preparing the destruction of the equilibrium.

American and European Wages.

The editorial entitled "Higher Wages in Europe" which appeared in our issue for November 28 meets with the disapproval of representatives of two very different classes of economists. One of them, speaking for the advocates of single tax, enters a general protest. The other, who is an eminent protectionist, regards some of the statements which were made in the article as "shocking political economy." The first believes we have claimed too much, while in the estimation of the second an egregious error is committed in not claiming more. It is clearly impossible that both of these critics can be right, as they are diametrically opposed to each other. Both can produce ponderous tomes in defense of the positions they have taken, and they stand prepared to hurl dangerous missiles of theory and example at the unwary man who ventures ever so little into what they regard as their special domain of thought. But when both unite to attack such an intruder they confer upon him a degree of importance of which he had probably never dreamed. He may be right and they may both be wrong. Let the facts in the case be the proof and not mere theories. The single-tax advocate—who by the way is Edward J. Shriver, secretary of the New York Metal Exchange—writes us as follows:

To find your conservative journal on the side of high wages is as gratifying as it is surprising, but it strikes me that your editorial on the subject this week assumes a great deal that can by no means be taken for granted. Passing over what is to me the palpable error that tariffs at any time or under any circumstances aid to increase or maintain wages, there is no possible guarantee or even reasonable probability that the recent victories of the English workingmen in their struggle for higher wages will have more than a temporary effect. Their position is stronger than that of American workingmen, because the English commercial policy is not—like ours—so stupid as to hinder every possible branch of industry with a miscalled protective tariff, which for the benefit of a few who monopolize certain natural advantages increases cost, and by thus narrowing the market at once limits the field for employment and cripples employers so as to reduce their power to pay high wages.

But the British system of taxation is only a step in advance of our own. With them, as

with us, nearly all the burdens of government are laid upon industry in the shape of taxes upon consumption or improvement. By this system not only are the possessors of valuable land left with the power to extract from the workers upon it (whether with brain, with capital or with hands) the bulk of their earnings, but they are encouraged to hold it out of use for a speculative rise in value. Although momentarily successful in their demands for an increase of their pittance, the dock laborers or bakers of London, the coal-miners and nail-makers in the manufacturing districts, are as much as ever at the mercy of not their immediate masters, but of those who are lords of both masters and men, the owners of the soil; and so far as any competition of theirs would affect wages in this country it is as potentially destructive as ever.

European competition is not what American workingmen have to fear, however, for wages in this country are already the lowest in the world when measured by product, the only correct standard. Nor is it pressure of population that is producing American pauperism, for while our population has grown our production of everything that is necessary to support life and impart comfort has increased in still greater proportion. Pressure of population always means increased wealth, and it is only under an unnatural system such as we keep up that it means wealth for the few and not for the many. Turn your eyes from the delusive results of wages disputes on foreign shores to see how at home profits have diminished at the same time as wages have fallen; consider how the boundless opportunities for labor on this great continent have been gradually fenced off from the hands and minds eager to use them, who now have to pay toll for the privilege of working or are even denied the right to labor at all if the monopolist fancies that he will get a greater tribute by waiting, and you will see that it is not through the puny efforts of labor agitators that the condition of American workingmen is to be improved, but by striking off the shackles which now bind trade and production in the guise of restrictive tariffs and fines for building houses and factories and by placing taxes where they belong—on that annual value of land, chiefly lying in city lots, in mines or in forests, which, being created by the presence of a community, by right belongs to its creator.

This communication almost answers itself, but there are some points which may properly receive comment. The reference to the position of this journal with regard to high wages is undeserved and is probably merely an attempt at smartness, which will be so considered. If it is a palpable error that tariffs increase or maintain wages, it will be as difficult to prove such a statement as to prove that the nose is not the organ of smell. A shrewd casuist can undoubtedly do it, but the people will still hold to the other opinion, believing in the visible fact.

There is of course no guarantee that the victories of English workingmen will have more than a temporary effect; that is what we fear, nor did we claim more. But we insist that the European situation has seldom been more encouraging for wage-earners on both sides of the Atlantic than now. In the very next sentence after dwelling on the hopelessness of expecting better wages in England, Mr. Shriver declares the English workingman's position stronger than that of the American. We presume that the explanation is that a man is safer and less likely to fall at the bottom of a ladder than when he is near the top. American workingmen, being pretty well paid on the whole, are of course always in some danger of being reduced, while it would be almost impossibe to reduce the wages recently prevailing in many occupations in England.

The screed against the few who monopolize natural advantages, &c., is out of joint with the times and should be set aside, to be trotted out when we have our next depression in trade. It will have a better chance to be believed then than now, with the wonderful expansion at present going on in all productive industries. Wages may be lower in some lines in this country when measured by product, but this is not universally or even generally true. Mr. Shriver says that pressure of population always means wealth. China and India, then, surpass in wealth Great Britain, France or the United States. This is very good doctrine indeed, worthy of a disciple of Henry George. It is true that "boundless opportunities for labor have been gradually fenced off" in this country, but there are other boundless opportunities still existing for those who have the brain and brawn to grasp them. It is all very well and very pretty to talk of "striking off shackles" of all kinds, but the imaginary fetters which we have forged for ourselves may not be half as galling as the fetters which others might be able to bind on us if we gave them the chance.

The protectionist who takes issue with us is Henry Carey Baird, one of the most accomplished pamphleteers of the day, a nephew of Henry C. Carey and a zealous disciple of his uncle's creed. His comments are too brief to be put in the form of a communication, but they are accompanied by a pamphlet setting forth his views with regard to protection, chiefly on raw material. He objects to our statement that tariff protection will enable high wages to be paid only so long as the country in which it is enforced does not produce more than it can consume. Of course in an ideal condition which never can be attained a country would not allow itself to produce more than it could consume; but employments would be more and more diversified as excesses appeared, until a perfect harmony of interests prevailed among all classes of producers and the complexity of business ran along as evenly as a well-regulated watch. The theory is good, but the facts are with us, admittedly owing to the imperfections of human nature.

There is a growing public interest in forestry which is in large measure the result of the persistent efforts of State and national forestry associations that have been striving for a wiser administration of the woodlands. We have received from the secretary of the American Forestry Association a printed copy of an address delivered at Philadelphia last October by the Hon. Carl Schurz, in which he discussed the need of a national forest policy in the United States. He described the barren districts of Asia and the sterile parts of Spain where agriculture had prospered before the forests were destroyed. Next he told about affairs in this country and showed how rapidly the forests were disappearing, not alone in marketable lumber, but in flame and smoke as well, for it is a sad fact that large areas of wooded lands are annually stripped by fires carelessly or criminally started. The prevention and control, where possible, of forest fires is a necessity only too evident to all who have looked into the matter. But it is the indifference of public opinion to all the stealing, the waste and the injudicious cutting down of the woods that the speaker looked upon as the evil most needing correction. This, however, is a slowly lessening evil, and it is a pleasure to learn that beginnings, however small, are making toward the conservation of the forests on this continent. Experience bears ample witness to the harmful results that follow the general deforesting of a country, but even were there no experience to learn from, common sense should teach a people that their enduring interests depend upon a sufficient acreage of wooded lands. Public opinion is the only whip that will drive legislatures into the making of just, wise and effective forest laws, and in the building up of public opinion every one takes part.

Chicago's Position in the Iron Trade.

A correspondent writes us asking for statistical information as to the position which Chicago now holds in the iron trade of the country. Presuming that many of our readers have some interest in the subject, it has occurred to us that the query might well be answered publicly. The iron and steel interests of Chicago properly include not only the works embraced within the corporate limits of the city but those located in its immediate vicinity, as, for instance, at Joliet, East Chicago and Hammond, all of which have offices in Chicago and are regarded by their owners as Chicago enterprises. At present the number of blast-furnaces is 13, nearly every one being of modern type and well equipped. Five new furnaces are under construction, one of them at Joliet and four at South Chicago. There are 14 separate rolling-mill plants, turning out steel rails, beams and other structural shapes, wire-rods, steel tires, fish-plates, railroad spikes, horseshoes and bar-iron. Plates and sheets are not yet enumerated among the products of the Chicago mills, but a plate-mill and a sheet-mill are projected, and ground will be broken for them in the spring if not before that time. Connected with rolling-mill plants are five Bessemer-steel works of the standard pattern. Two Robert-Bessemer steel works have recently been built and others are contemplated. Two small open-hearth steel works are in existence now, and a large plant of this class is to be built in the spring in connection with the plate-mill above alluded to.

The production of pig-iron in the Chicago district has been practically stationary in the past two years, according to published statistics. The annual product in this period has slightly exceeded 500,000 gross tons, which, however, surpasses the output of previous years. As compared with the production of the entire country Chicago turned out 8 per cent. of the total output of pig-iron in 1888, but only 7 per cent. in the period embraced in the last half of 1888 and the first half of 1889. The new furnaces now under construction, which will all be of large capacity and the most modern type, will probably double the yield thus far achieved, in which case Chicago will assume much greater importance in the pig-iron industry of the nation. Probably nine-tenths of the pig-iron made in the Chicago district is of Bessemer quality, used in the local Bessemer-steel works. The foundries in

the vicinity being numerous and many of them of large capacity, the consumption of pig-iron is far in excess of the local production, and the demand will by no means be covered by the additional furnaces now building which are intended for the manufacture of Bessemer pig-iron.

Chicago plays a much more important part, relatively speaking, in the steel-rail trade than in any other branch of the iron industry. In that district alone nearly one-third of the entire steel-rail production of the country was turned out in 1888, as also in 1887, against one-fourth in 1886. In the year 1887, which was the year of maximum output in the American rail trade, when 2,101,814 gross tons of Bessemer-steel rails were produced, the Chicago mills turned out over 600,000 tons. This was considerably more than half the production of all the steel-rail mills of Great Britain in either 1887 or 1888, more than the combined production of France and Belgium and probably more than the annual production of Germany. In 1887 Cook County alone, excluding Joliet, which is in Will County, turned out 531,054 gross tons of Bessemer-steel ingots. The time seems to be near at hand when the Chicago district will make 1,000,000 tons of Bessemer-steel ingots per annum. One of the Bessemer-steel plants of the city produced no less than 36,232 tons of ingots in a single month this year, which shows what the works are capable of doing when the demand justifies special exertions.

Speaking of the strides made in the concentration and development of the coke industry, a member of the firm of H. C. Frick & Co. said recently: The Frick Coke Company shipped 200 tons of coke the first day they occupied their offices in Pittsburgh, January 1, 1887. This company removed on November 25 to their new offices, which are connected with those of Carnegie Bros. Their shipments that day exceeded 23,000 tons of coke. One thousand two hundred and seventy-one cars were required for this. Standing in trains, these would extend more than seven miles. It is said that the six largest producers of coke in the world combined do not make as much coke as the Frick Company. All the rest of the United States combined do not make as much.

The largest gun in the world was recently manufactured for the Russian Government at the Krupp works in Essen. United States Consul Partello, of Dusseldorf, says the gun is made of cast-steel and weighs 135 tons. The caliber of the gun is about 16¼ inches. The barrel is 44 feet long, the core having been removed in one piece. The greatest diameter is 6½ feet, and the range of the gun is about 12 miles. It will fire two shots per minute, each shot costing (as per contract) $1500. At the trial of the gun held in the presence of Russian officers and many others at Meppen, the range near Essen on the Ruhr, the projectile, 4 feet long and weighing 2600 pounds, was propelled by a charge of 700 pounds of powder, penetrating 19 inches of armor, and went $1\frac{3}{12}$ yards beyond the target.

The office of the J. M. Schoonmaker Coke Company has been removed from 120 Water street to the Hussey Building, Pittsburgh. Under the reorganization of the company the following officers have been elected: S. L. Schoonmaker, president and treasurer; J. M. Ritchie, secretary, and W. C. Magee, general agent.

Our Active Furnaces.

A FURTHER INCREASE.

The unprecedented production of pig-iron continues. We entered the month of December with an output greater by nearly 5000 tons a week than we were making early in November. The coke furnaces again are responsible for the lion's share of the increased product. The make of individual plants was again very heavy, the Pittsburgh district particularly showing an increase of nearly 1000 tons per week more. Preparations are going forward to make available additional capacity, long idle, but, as has been the case during November, the blowing in of such furnaces is largely counterbalanced by the temporary stoppage for repairs of a few large furnaces. The advance in Bessemer pig during the month and the probability, amounting to almost a certainty, that foundry iron in the East will reach the basis of $20 at an early date, coupled with the growing demand for forge grades—all these facts will act as very active stimulants toward bringing into activity additional plants. Every month during the winter is scheduled for the appearance in the list of producers of plants now approaching completion. The blowing in of one of these modern furnaces, with a capacity ranging from 700 to 1500 tons a week, means a good deal more than the revival of old stacks, with a weekly make of 250 to 500 tons, the latter being generally the maximum of these old-fashioned plants.

As compared with previous months the record stands as follows:

	Number in blast.	Weekly capacity.
December 1	328	169,151
November 1	323	165,225
October 1	311	151,057
September 1	294	134,068
August 1	286	145,899
July 1	285	141,419
June 1	286	137,119

These figures indicate a product during the second half of the current year of about 4,100,000 gross tons, which at the rate at which the output is now going on is over 8,750,000 gross tons per annum, providing work goes on undisturbed by accidents or labor troubles.

On the 1st of the month the status of the anthracite furnaces was as follows:

Anthracite Furnaces December 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York	23	9	3,388	14	4,308
New Jersey	14	3	1,410	11	4,094
Spiegel	3	3	235	0	0
Pennsylvania:					
Lehigh Valley	46	31	12,073	15	4,200
Spiegel	1	1	65	0	0
Schuylkill Valley	35	18	7,021	17	4,180
U. Susquehanna Valley	17	10	3,981	7	710
Lebanon Valley	16	14	7,301	2	503
L. Susquehanna Valley	21	11	4,579	10	3,280
Totals	176	100	40,053	76	21,365

For the past 13 months our records show the following:

	Furnaces in blast.	Capacity per week.
December 1	100	40,053
November 1	96	40,603
October 1	94	36,558
September 1	93	35,997
August 1	88	34,377
July 1	89	34,142
June 1	91	34,386
May 1	95	35,315
April 1	102	37,977
March 1	103	37,937
February 1	107	39,187
January 1, 1889	107	38,726
December 1, 1888	99	34,879

In New York there has been no addition to the capacity during the month. Port Henry changed from mill iron to Bessemer early in November and Cedar Point will begin to make the same quality of iron in about a week. In New Jersey Franklin blew out for general repairs on the 14th ult., so that now only three of the furnaces in the State are producing iron. In the Lehigh Valley the Bethlehem Company are now running six furnaces, Carbon is producing with two, while Macungie blew in on the 26th ult. The lease of the Lucy Furnace, formerly operated by the Thomas Iron Company, has expired, and it is understood that it will be put in blast at an early date by a Bethlehem company. In the Schuylkill Valley one of the Keystone furnaces blew out on the 2d inst., while Reading now has both in operation. Keystone No. 1 will be remodeled, its hight being increased to 65 feet. No. 2 is already undergoing a similar change and will be running probably on the 1st of February, No. 1 following on the 1st of March. On the Upper Susquehanna Bloom Furnace has been running in November. On the Lower Susquehanna one of the furnaces of the Pennsylvania Steel Company has gone out of blast, while in the Lebanon Valley North Cornwall has stopped in order to undergo the rebuilding to which we have already referred. Among the furnaces which are expected to go into blast at an early date is the Edge Hill, in the Schuylkill Valley, which has been leased to the Crane Iron Company, who will make Bessemer pig.

The following is a statement of the coke capacity working on the 1st of this month:

Coke Furnaces December 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York	4	1	513	3	3,600
Pennsylvania:					
Pittsburgh district	20	20	25,388	0	0
Spiegel	1	1	701	0	0
Shenango Valley	19	15	10,115	4	2,053
Juniata and Conemaugh valleys	17	10	4,961	7	3,010
Spiegel	1	1	513	0	0
Youghi. Valley	5	5	1,998	0	0
Miscellaneous	4	4	2,548	0	0
Maryland	2	2	1,410	0	0
West Virginia	6	3	1,796	3	1,138
Ohio:					
Mahoning Valley	14	13	11,029	1	750
Central and Northern	19	14	10,728	5	3,487
Hocking Valley	14	4	1,286	10	3,140
Hanging Rock	13	6	1,392	7	1,350
Indiana	2	1	160	1	210
Illinois	13	10	11,205	3	3,082
Wisconsin	4	4	2,372	0	0
Missouri	6	2	1,063	4	2,218
Colorado	2	1	570	1	570
The South:					
Virginia	13	10	5,672	3	950
Kentucky	4	1	228	3	760
Alabama	30	23	14,398	7	3,830
Tennessee	11	10	4,738	1	674
Georgia	2	1	550	1	310
Totals	226	162	116 319	64	31,132

As compared with the 13 previous months, the active coke furnaces make the following showing:

	Furnaces in blast.	Capacity per week.
December 1	162	116,319
November 1	160	112,269
October 1	154	102,454
September 1	141	96,744
August 1	137	96,720
July 1	136	96,584
June 1	135	91,771
May 1	147	98,399
April 1	151	100,060
March 1	150	100,757
February 1	150	98,518
January 1, 1889	157	103,726
December 1, 1888	151	101,748
November 1	146	94,695

In New York the Troy plant was idle during the greater part of the month, all the furnaces being out on the 1st inst., a temporary stoppage, however. In the Pittsburgh district the output continues to

be exceptionally heavy. Clinton Furnance, now operated by the Clinton Iron Company, Limited, is to stop during the present month to be completely rebuilt. It is a very old furnace, having been erected in 1859. Under the most favorable circumstances it could not produce more than about 40 tons per day. When the proposed improvements are completed it is expected that it will be able to produce about 100 tons per day. From present indications it will be ready for work on about the 1st of May. In the Shenango Valley the great activity continues unabated. Among the furnaces soon to be added to the active list is the Alice, which it is expected will be ready for operations by the 15th inst. In the Juniata and Conemaugh valleys one of the Johnstown furnaces is now running on spiegel. Everett will probably blow in on the 20th, making foundry iron on lake and local ores. Every one of the furnaces is in operation in the Youghiogheny Valley and the same is true of the four stacks which we group under miscellaneous, Center having blown in during the month, while Cameron, which was stopped for repairs, started again on the 1st inst.

In Maryland Catoctin began to produce again on the 28th ult., while the one furnace at Sparrow's Point, of the new plant of the Pennsylvania Steel Company, made its first month's run. Irondale, in West Virginia, has just blown in. In the Mahoning Valley, Ohio, current capacity was increased by the resumption of Haselton on the 25th ult. The furnace is now 75 x 19 feet, with three 75 x 18 Cowper-Kennedy stoves. The only fact worthy of notice in connection with the furnaces grouped under the general title of Central and Northern in Ohio is that Emma is temporarily out of blast. There have been no changes worthy of notice in the Hocking Valley or the Hanging Rock Region. The Illinois furnaces made in October 537,772 tons, but current capacity has been decreased by the blowing out on the 30th ult. of one of the stacks constituting the South Chicago plant of the Illinois Steel Company. All of the furnaces in Wisconsin are now running full, while in the far West the blowing in of Mary Furnace of the Colorado Coal and Iron Company adds a new producer.

In the South Virginia has increased current capacity by the resumption of Victoria furnaces on the 24th ult. In Alabama Lady Ensley made its first cast early in November, but on the other hand both of the Alice furnaces went out for repairs. Hattie Ensley, formerly known as the Sheffield Furnace, has resumed since the beginning of the month. In Tennessee and in Georgia there have been no changes worthy of note. Cherokee is getting ready.

The charcoal furnaces started this month as follows:

Charcoal Furnaces December 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England	14	7	610	7	480
New York	8	3	306	5	523
Pennsylvania	23	7	530	16	490
Maryland	3	2	226	5	300
Virginia	23	4	295	19	686
West Virginia	3	0	0	3	165
Ohio	13	7	503	6	575
Kentucky	3	3	203	0	0
North Carolina	2	1	70	1	70
Tennessee	8	4	1,164	4	510
Georgia	2	1	120	1	90
Alabama	12	9	2,039	3	748
Michigan	25	12	4,045	13	3,640
Missouri	3	2	609	1	210
Wisconsin	6	3	1,643	3	710
Texas	1	0	0	1	173
California	1	0	0	1	120
Washington	1	1	175	0	0
Oregon	1	1	181	0	0
Totals	155	66	12,779	89	9,190

As compared with previous months the record stands as follows:

	Furnaces in blast.	Capacity per week.
December 1	66	12,779
November 1	67	12,893
October 1	63	12,047
September 1	60	11,327
August 1	61	11,902
July 1	60	10,727
June 1	60	10,962
May 1	54	10,629
April 1	53	10,173
March 1	55	11,081
Feb. 1	62	11,219
Jan. 1	67	11,946
Dec. 1	71	12,286
Nov. 1	73	12,724

In New York Chatham and Copake resumed work in November. In Pennsylvania Hecla started on the 22d ult. and is doing well, making forge and No. 2 foundry iron. Mont Alto has been put back by rains in its work of renewing the plant. Pine Grove beat its former records in the week ending November 29th, its thirty-third, by averaging 21.5 tons of car-wheel iron per day on all ore, no scrap being used. S. R. Still, the superintendent, informs us that its best former record was 20 tons per day, scrap being largely used. The gases from the furnace heat the ovens and boilers, no coal being used to raise steam.

In the Hanging Rock region Olive is putting in two new Player hot-blast stoves and is making general repairs. Bloom was out most of the time in November, putting in a new hearth. In Michigan Antrim made 515 tons in one week. The plant is now equipped with a new Weimer blowing-engine, with 72-inch blowing-cylinder, 28-inch steam-cylinder and 48-inch stroke. Elk Rapids blew in on the 6th of October. During the last blast, of 368 days, the furnace lost 4 days. On the actual run of 364 days the product was 20,536.17 tons of 2260 pounds, making an average of 56.42 tons per day. The largest week was 476 tons 1864 pounds and the best day 70 tons 35 pounds. Pine Lake has gone out of blast for the winter. In Wisconsin Hinkle, Minneapolis and National are doing good work, the total product of the three in November having been 7040 tons.

In Tennessee No. 1 Warner started on the 20th ult., while in Alabama Gadsden has stopped for repairs, to be completed by January 1. Shelby has started its remodeled furnace. Woodstock had only one stack running on the 1st inst.

Tanks instead of turrets are proposed as a protection for big guns. The enormous size of modern rifles, a 12-inch gun being not far from 30 feet long and a 16-inch gun over 40, makes the problem of concealing them from the view of an enemy a difficult one. The only scheme so far proposed for saving the big gun from the enemy's fire is by placing it wholly inside a sunken steel structure built in the ship's deck and mounting it on a carriage by which it can be raised above the parapet when it is to be fired and then lowered again. There are two sorts of carriages that elevate a gun in this way, and it is possible to get a gun up, shoot it, and get it back again inside of six seconds. That sort of firing would baffle the quickest of small-rifle men. It is not improbable that circular steel tanks will take the place of turrets and redoubts on shipboard, and that a revolution in naval architecture is impending.

From England come reports that in the ship-building industry the rapid rise in steel is telling in favor of iron, which has not advanced so heavily. It is reported that the relative tonnage of iron shipping in yard is now greater than it has been for a considerable period.

There is some talk of the building of a steel plant at Anniston, Ala.

Washington News.

(*From Our Regular Correspondent.*)

WASHINGTON, D. C., December 10, 1889

Speaker Reed has made a new departure in the preliminary labors of his high office by announcing the *personnel* of committees as he has them ready, without keeping the whole business of the House suspended to await the completion of the whole list of 48 standing and 12 select. It has hitherto been the practice to delay the announcement of Ways and Means and Appropriations, for instance, until the completion of such committees as Militia, whose members meet but once or twice a session for a friendly smoke. This prompt action of the Speaker has infused a spirit of enthusiasm and business among the Representatives which will have a corresponding influence upon the morals of the majority in their parliamentary labors.

The Committee on Ways and Means announced yesterday has never been constituted so promptly. It also represents the economic views of both parties, and in its *personnel* draws the lines of contrasting political doctrines very sharply. On the Republican side we find Wm. McKinley, Jr., of Ohio, who has long been recognized as one of the foremost champions of protection, and on this ground a strong candidate for the speakership; Julius Cæsar Burrows, of Michigan, an active member of the minority of the last Committee on Ways and Means, and another strong candidate for speaker; Col. Thomas M. Bayne, of the Allegheny district of Pennsylvania, who takes the place of the aged champion of protection Judge Kelley; Nelson Dingley, Jr., of Maine, the defender of American shipping; Joseph McKenna, of California, one of the stanch advocates of protection on the Pacific Slope; Sereno E. Payne, of New York, one of the standard bearers of protection in the Empire State; R. M. La Follette, of Wisconsin, a tariff leader of the States of the Northwest, and John H. Gear, of Iowa, one of the founders of protection sentiment in the Granger State. In looking over the Republican *personnel* there is no room for doubt as to where each member stands. The Democratic minority of the committee are equally fixed in their views on tariff reform. The ex-Speaker, J. G. Carlisle, of Kentucky, and Roger Mills, of Texas; Benton McMillin, of Tennessee, and Clifton R. Breckenridge, of Arkansas, the foremost members of the last committee, and Roswell P. Flower, of New York, politically a free-trader and industrially a protectionist, make up this wing. The chairman of the committee has acted with the same promptness as the Speaker in calling a meeting for Thursday for organization, the designation of the sub-committees and the distribution of the President's message. They will then confer upon the general line of policy to be pursued with reference to the tariff question. There is no doubt of the preparation of a tariff bill, but whether it shall be made up from the material in hand or through the tedious ordeal of hearings and arguments already covered by the Senate will be determined later.

In the new *personnel* of the Committee on Ways and Means the name of Judge Kelley is missing, and Pennsylvania is represented by Colonel Bayne. The advanced age of Judge Kelley was the ground for this change. The fact that he did not vote for the successful candidate is not conceded to have had any weight. In order to quiet any misconstruction which might be placed upon the omission of Judge Kelley's name on the Ways and Means, he was given the chairmanship of the Committee on Manufactures. This committee, nineteenth on the

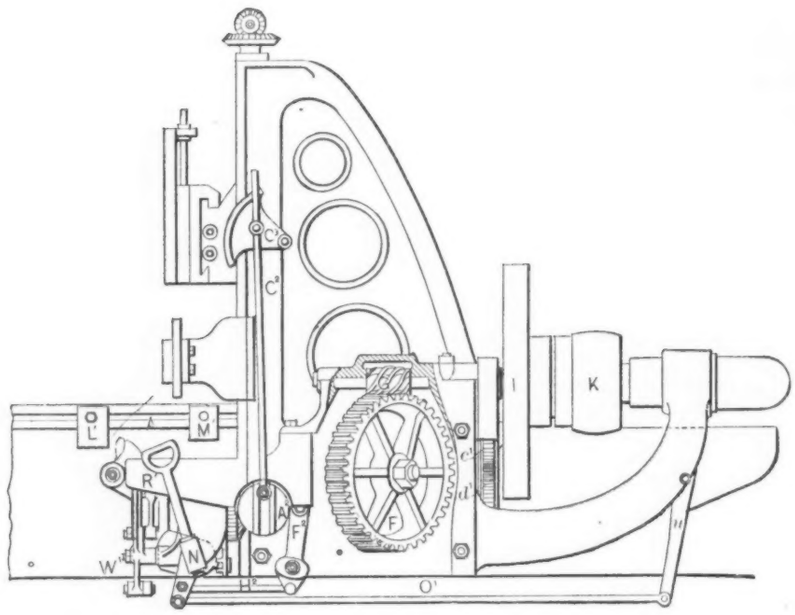


Fig. 1.—Side Elevation.

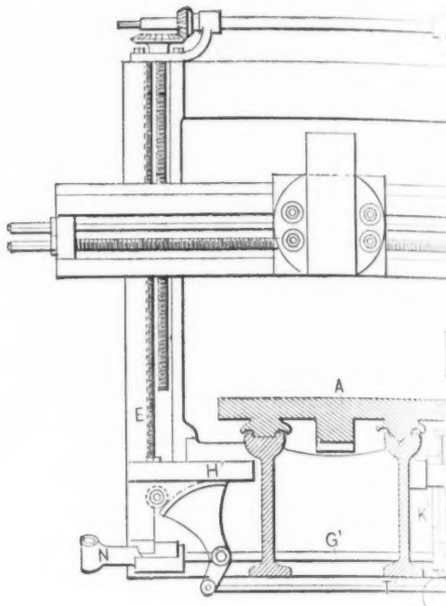


Fig. 2.—End Elevati

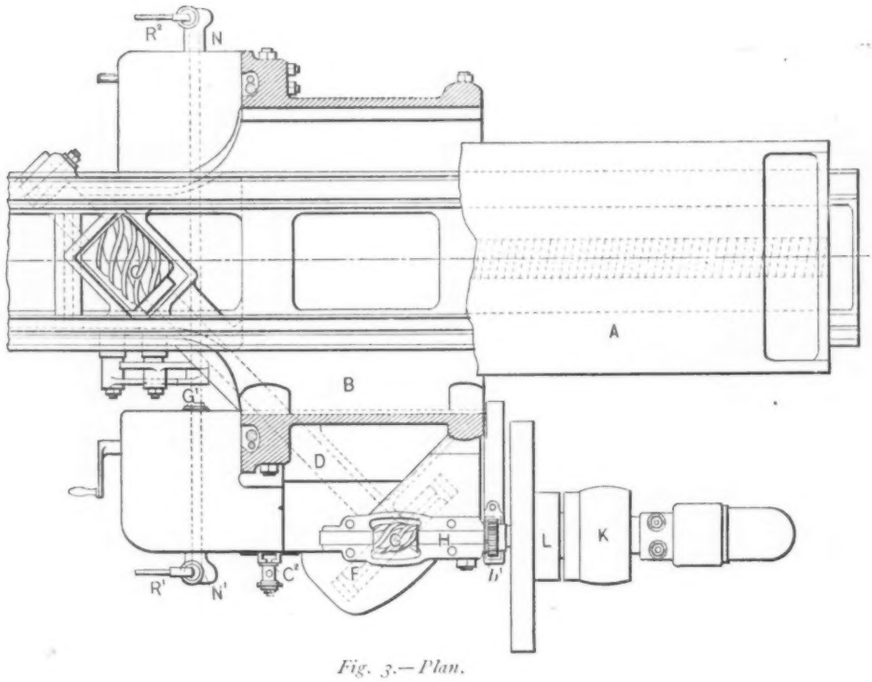


Fig. 3.—Plan.

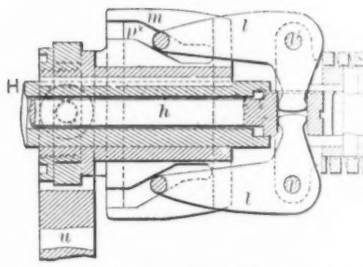


Fig. 8.—Sectional View of Clutch-Lev Position.

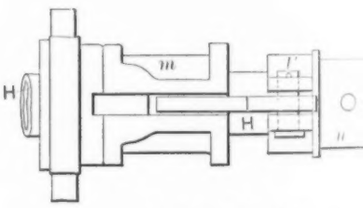


Fig. 9.—Plan of Fig. 8.

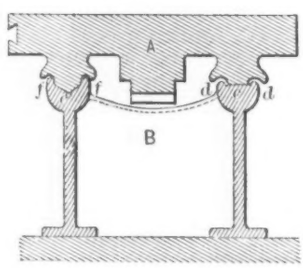


Fig. 4.—Section of Bed and Table.

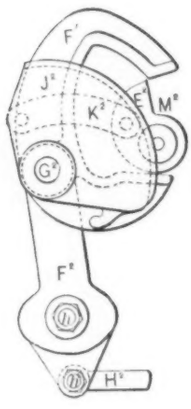


Fig. 15.—Enlarged View Revolving Cam for Operating the Double Friction-Clutch.

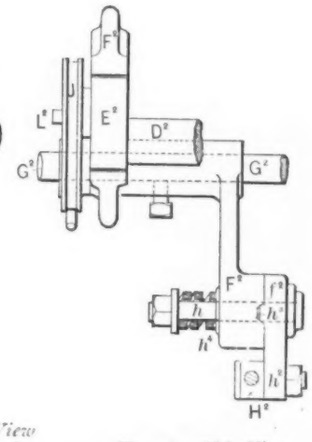


Fig. 16.—Side View Fig. 15.

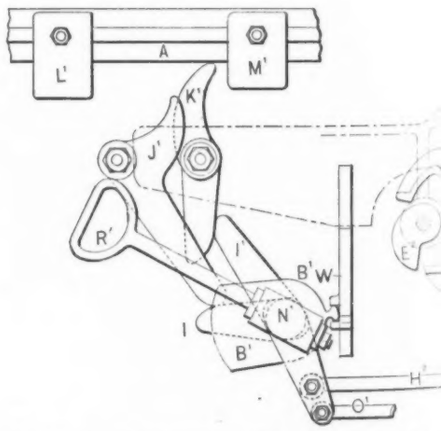
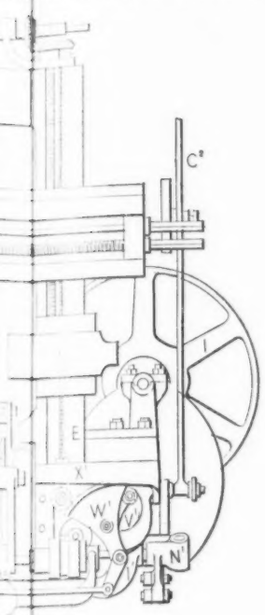


Fig. 17.—Shifter-Levers and Stops in Position for R



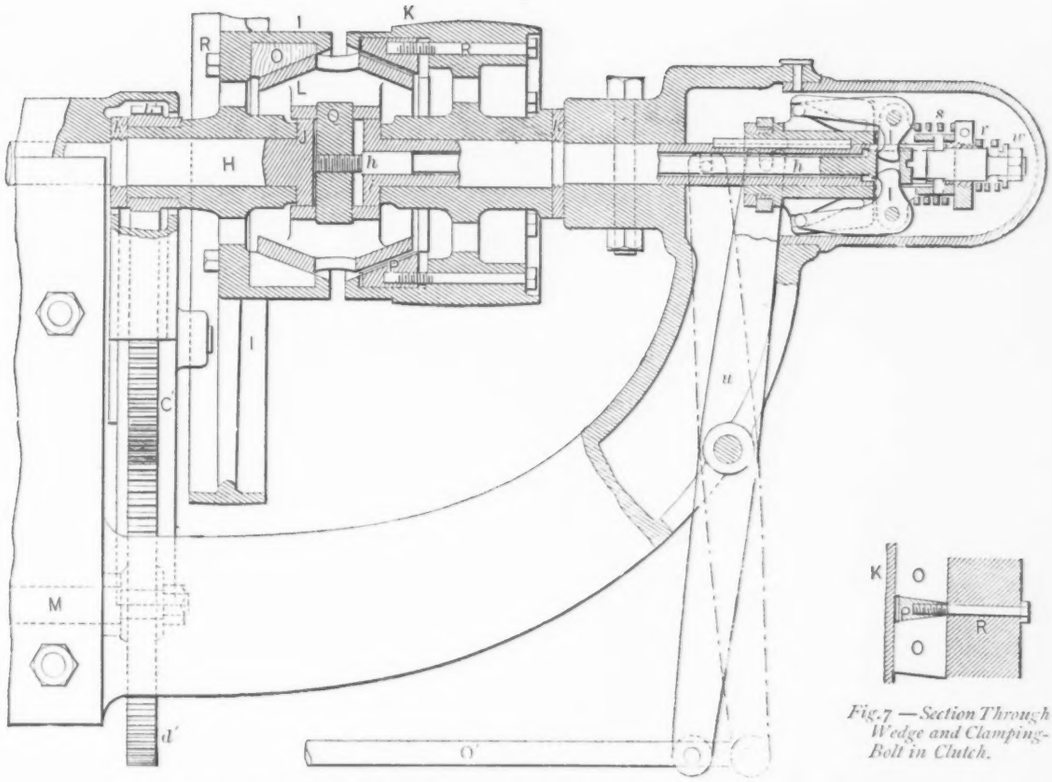
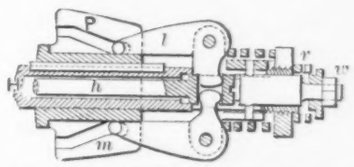
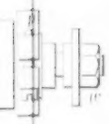


Fig. 5.—Section Through Pulley-Shaft Showing Clutch Mechanism.

Fig. 7.—Section Through Wedge and Clamping-Bolt in Clutch.



Fgg. 6.—Section Showing Clutch-Levers in Position for Back-Motion Pulley.



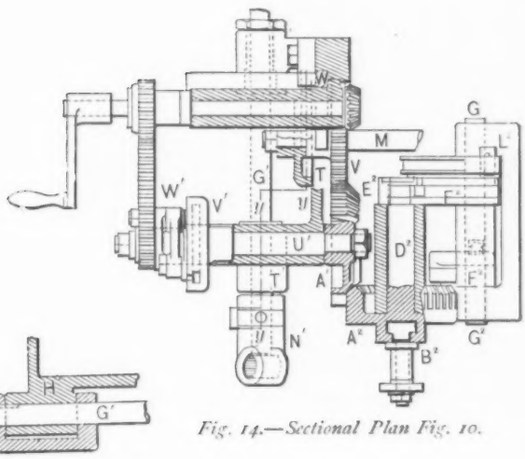


Fig. 14.—Sectional Plan Fig. 10.

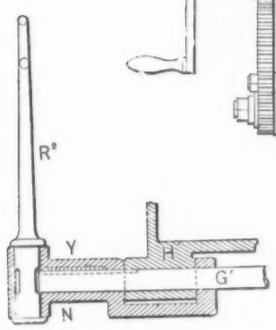
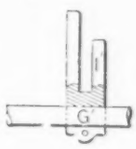


Fig. 20.—Section Through Reversing Block.



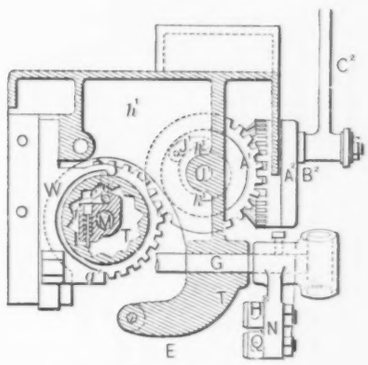
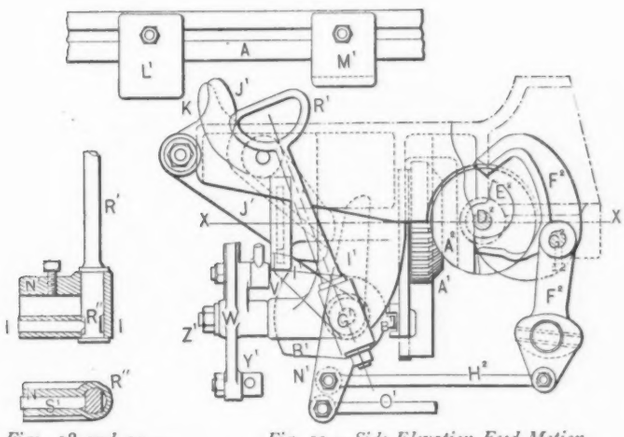


Fig. 12.—Sectional View Fig. 11.



Figs. 18 and 19.—Views of Hand-Reversing Lever on Shifter-Shaft.

Fig. 10.—Side Elevation Feed-Motion Stand.

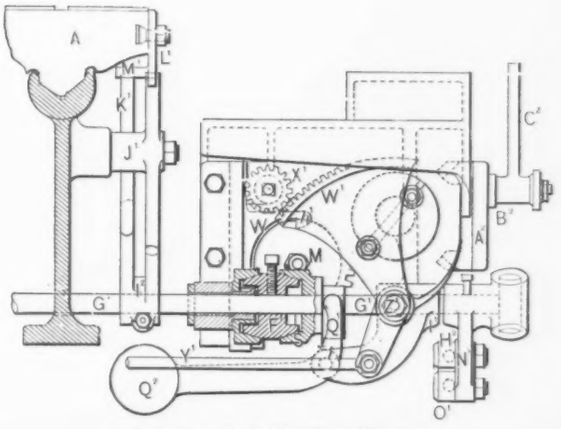


Fig. 11.—End Elevation Fig. 10.

list, occupies an undefined relation to the field of legislation. In all matters of revenue by the levying of duties upon manufactures, which is the important relation of the Government to industry, the Ways and Means has the monopoly. The interests of manufactures in the local sense are under State control, and questions of an interstate character seldom come up in legislation. The subject of trusts and the questions leading out from that perplexing topic of recent economic deliberation will give this committee greater weight than it has hitherto held in the business of the House The committee is made up of men of standing and ability. The Republicans are: Chairman, William D. Kelley, of Pennsylvania; Julius C. Burrows, of Michigan; W. O. Arnold, of Rhode Island; Elija A. Morse, of Massachusetts, and John Sanford, of New York. The Democrats are: W. L. Wilson, of West Virginia; W. D. Bynum, of Indiana; J. R. Williams, of Illinois; Thos. W. Grimes, of Georgia, and S. D. Fowler, of New Jersey.

One of the next committees will be that on Naval Affairs. The senior Republican for some years has been A. C. Harmer, of Pennsylvania. There exists some opposition to Mr. Harmer being given the chairmanship to which he would be entitled almost by precedent and certainly by experience, on account of his active advocacy of the election of Major McKinley for Speaker and a clerk in opposition to the wishes of a large majority of his party colleagues in the State delegation. The only other re-elected Republican on the committee is Charles A. Boutelle, of Maine. The selection of the *personnel* is yet undetermined. It is known, however, that the majority will be made up of Representatives who will favor a liberal policy toward the navy in the building of battle-ships, cruisers, gunboats and every other craft necessary to the fighting qualities of the marine wing of the Government, and an equally liberal policy in the equipment of the navy-yards so as to adapt them to the uses of the modern navy.

PERSONAL.

Walter Wood, of R. D. Wood & Co., Philadelphia, has returned from Europe.

Frank C. Roberts, Philadelphia, has opened a branch office at 118 Lewis Block, Pittsburgh, which is in charge of John B. Miles, C.E., formerly assistant engineer on the Pennsylvania Railroad.

T. W. Robinson has been lately appointed manager of the Milwaukee Blast-Furnaces of the Illinois Steel Company, at Bay View, Wis.

Dr. R. W. Raymond, secretary of the American Institute of Mining Engineers, has returned to New York after two months' absence in Montana.

Jos. C. Platt, who has been president of the Mohawk and Hudson Mfg. Company (Eddy Valve Company), of Waterford, N. Y., since their incorporation in 1875, has withdrawn from participation in its management.

Edwin S. Cramp, of Philadelphia, has assumed the duties of superintending-engineer to the Wm. Cramp & Sons Ship and Engine Building Company.

William N. Page is now in charge of the Gauley Mountain Coal Company, with headquarters at Ansted, Fayette County, W. Va.

A. A. McLeod has been elected vice-president of the Philadelphia and Reading Coal and Iron Company and C. E. Henderson has been appointed general manager, succeeding Mr. McLeod in that position. Mr. Henderson was formerly general manager of the Indiana, Bloomington and Western Railroad.

N. S. Chamberlain and A. M. Shook, of Chattanooga, have returned from a visit to English and German steel-works to study the basic process.

Minor Scovel has resigned the presidency of the Scovel & Irwin Construction Company, of Nashville, Tenn., to become their consulting-engineer. He has opened an office in Nashville as an engineer for blast-furnaces, water-works and sewerage systems.

Ad Valorem Duties on Imports.

In a letter written recently by Assistant Secretary Techenor to the Collector of Customs at New York, the following rules are prescribed for the assessment of ad valorem duties on imports:

With a view to constitute a practical and sufficient rule for the general guidance of customs officers in the ascertainment and determination of dutiable values, it may be prescribed—

1. That the dutiable value, or in other words the determinate value of any merchandise upon which the law imposes an ad valorem rate of duty is legally based upon and derived from three separate valuations of such merchandise, designated the "invoice value," the "entered value" and the "appraised value," and made respectively by the exporter, the importer und the government appraiser.

2. That sections 2900 and 2906 of the Revised Statutes, as construed by the United States Supreme Court in the Oberteuffer case (S. 7387), provide (*a*) that duties shall be assessed upon the appraised value of the goods *per se*, but also (*b*) that it shall not be assessed upon an amount less than the invoice value, nor (*c*) upon an amount less than the entered value of the same, and therefore whichever one of these shall prove to be the greatest must be taken and held to be the dutiable value.

3. That the invoice value of the goods *per se* is a fact that can be determined only by the specifications of the invoice itself, and the duty devolves upon the Collector and Naval Officer to make such determinations whenever it shall be required to ascertain the dutiable value of any merchandise. In the discharge of this duty they will be governed by the decisions of the Department affecting any particular specification that may appear in the invoice.

4. That the law requires the owner, consignee or agent to enter his merchandise at the invoice value thereof, and under Section 2900 of the Revised Statutes permits him to make addition in the entry "to the cost or value given in the invoice," but does not permit him to make any deduction therefrom. The legal entered value, therefore, must be either the invoice value alone or that value plus the specific addition thereto made by the importer on his entry. And whenever it shall be necessary to determine the entered value of any merchandise *per se*, the statement of invoice value on the entry should be compared, and if necessary corrected to agree with the value of such merchandise as set forth in the invoece.

5. That the appraised value of the goods *per se* is their "true and actual market value and wholesale price, any invoice or affidavit thereto to the contrary notwithstanding," which is required to be ascertained, estimated and appraised as provided in Section 2902 of the Revised Statutes. This value can be determined only by persons duly authorized and acting as appraisers, and therefore this value so determined must be accepted for comparison with the invoice and the entered value of the goods *per se*, when the determination of dutiable value shall be made by the Collector and Naval Officer.

6. That these instructions shall apply in all cases where the invoice value of the goods *per se* can be determined.

Electric Motors.

The introduction of motors for power transmission will soon be governed by their cost. The questions of reliability, safety and convenience are all important, but dollars and cents are the most conspicuous considerations, and this point is by no means overlooked in the manufacture of motors. The evolution of a perfect machine of this character is necessarily a slow process, says *Electric Power*. Its original design and construction is in the hands of the inventor and a few practical mechanics. When it is placed in actual service the modifications begin. It is strengthened in one part and lightened in another. Its construction is gradually simplified. The arrangement of the parts is changed in order to facilitate examination and possible adjustment. Nothing but the lapse of time and the exigencies of actual service will develop all the faults and suggest all the improvements which may be made. When practical perfection is eventually attained special machinery may be devised which will bring the cost of prduction down to the lowest point, greatly enlarging the sales, even if the profit on each motor is reduced. This is the natural course through which any line of manufacturing must pass in order to attain the highest degree of perfection. So long as competition tends toward the production of a better article at less money it is beneficial, provided it is done at a reasonable pr fit; when, however, an effort is made to reduce cost by introducing an insufficient quantity of material, or that of an inferior quality, the result is more likely to show loss rather than gain. The high speed at which dynamos and motors are run, and their susceptibility to damage if not properly balanced and fitted, has led up to first-class workmanship. Therefore it seems reasonable to suppose that in this particular branch of the electrical business there is little apprehension of retrogression.

Like the late Captain Ericsson, Dr. Gatling, of Hartford, has invented a "destroyer." He is completing a torpedo-boat of steel throughout, 155 feet long and 17 feet beam. It will carry a crew of 23 men and will have for propelling power three engines, two for the twin screws and one to manipulate a number of pneumatic guns, which will be part of the equipment. In addition to these guns the cruiser is intended to carry several rapid-firing Gatling and Hotchkiss guns, a spar-torpedo and a torpedo-gun, with two dynamite guns. She is intended to be seaworthy enough to cross the ocean and to have an armament which would make her formidable in close action.

All-rail rates are being named on iron ore from the mines to points of consumption. Last week the Milwaukee and Northern Railroad announced a freight rate of $2.75 per gross ton from Iron Mountain, Mich., to Indianapolis and $3.36 to New Albany, in connection with the Monon route.

A. & P. Roberts & Co., Pencoyd Iron Works, Philadelphia, deny that they have any intention at the present time of changing the location of their works.

The Union Pacific railway shops going up at Leavenworth, Kan., will cost some 000.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, December 9, 1889.

The new business arising during the past week was notably less than that of the previous week, yet there was by no means a relapse into complete inactivity. The demand for Iron and Steel continues, and furnaces and mills are more completely in mastery of the situation. There are now very few concerns for whom this is the natural market that are able to take orders for even reasonably prompt delivery. Prices still have an upward tendency, and outside quotations of a fortnight since are becoming inside quotations of the present.

Pig-Iron.—Lake Superior Charcoal Iron is at last securing its share of attention. Large sales have been made both for early delivery and for scattered deliveries next year. Makers are looking forward to a good demand for chilling grades, because orders for cars are so abundant, with numerous railroads still short of rolling-stock. While it may be possible to pick up some brands at $21.50, cash, the usual asking price is now $22. Local Coke Foundry Iron can no longer be had at the rates quoted last week, the gap between the prices of the several brands having been pretty well closed up. Cash quotations now are $19.50 @ $20 for No. 1; $18.50 @ $19 for No. 2 and $18 for No. 3. Such Southern Coke Iron as is still available is held at about $20 for No. 1, $19.50 for No. 2 and $19 for No. 3. American Scotch (Blackband), No. 1, is quoted at $20.50 @ $21.50, according to brand, quantity, &c.; Ohio Silveries, No. 1, $19.25 @ $20; Tennessee Charcoal, No. 1, $20 @ 21; Alabama Car-Wheel, $25 @ $26.50.

Bar-Iron.—Manufacturers are very firm, and quotations now made range from 1.95¢ to 2¢, half extras, f.ob., Chicago, for mill lots of Common Iron. Buyers able to shade the inside price are fortunate. Car-Iron is quoted at 1.95¢ @ 2¢, flat, at buyer's works, with good specifications in the market. Jobbers quote from stock at 2.1¢ @ 2.2¢, according to quantity, &c., but talk of making an advance, which, however, may not occur until after the holidays. Norway Iron is still getting dearer and is now held at 3.75¢ @ 4¢.

Structural Iron.—Prices are hard to quote in the present condition of the mills, as no time is allowed for consideration. To-day's rates, which may be wholly changed to-morrow, are as follows for deliveries on cars at Pittsburgh: Angles, up to 5-inch, 2.35¢; over 5-inch, 2.45¢; Tees, 2.85¢ @ 3¢; Universal Plates, 2.35¢ for Iron and 2.45¢ for Steel up to 16 inches wide, and 2.55¢ from 16 inches up; Sheared Bridge-Plates, 2.65¢. Freight to Chicago is 17½¢ ℔ cwt. Carload lots of Beams and Channels are 3.20¢, Chicago. For small lots from stock of Angles, 2.70¢ @ 2.75¢ is asked; Tees, 3¢; Beams and Channels, 3.70¢.

Plates, Tubes, &c.—Jobbers report an excellent store trade, with orders coming to this market from Kansas City, Denver, New Orleans and even from points in Ohio, demonstrating the growing scarcity of this class of material. Prices are firm and on some items higher. A large buyer reports having received advices from five prominent mills that they are out of the market for any deliveries prior to next April, and other manufacturers have so advanced quotations that a higher level of values must soon obtain here. Carload lots are quoted as follows, f.o.b. Chicago: Nos. 10 to 14 Iron Sheets, 2.75¢; Steel do., 3¢; Tank Iron, 2.65¢; Tank Steel, 2.85¢. From store the following prices are quoted: Iron Sheets, Nos. 10 to 14, 2.90¢ @ 3¢; Steel do., 3¢ @ 3.1¢; Tank Iron, 2.70¢; Tank Steel, 2.90¢ @ 3¢; Shell Steel, 3.15¢ @ 3.25¢; Flange, 3.50¢; Fire-Box, 4.25¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler-Rivets, 4¢ @ 4.25¢; Boiler-Tubes, 50 % off for 1¾-inch and less, 52½ % off for 2-inch and 55 % off for over 2-inch.

Sheet-Iron.—Galvanized Iron is far more in demand at present than Black Sheets, manufacturers' agents being crowded with business. An impression is quite general that prices will be higher after January 1, if, indeed, the dearness of raw material does not compel an advance before that time. Jobbers quote Juniata at 50 and 10 % off. Black Sheets are firm at 3.15¢ @ 3.20¢ at mill and 3.50¢ from store for No. 27.

Merchant Steel.—Business has been quiet in this line, but the mills are very stiff and in some instances have marked prices up from $2 to $4 ℔ ton. Base prices for carload lots are as follows, f.o.b. Chicago: Tire, Toe-Calk and Machinery Steel, 2.60¢ @ 2.80¢; Open-Hearth Spring, 2.65¢ @ 2.85¢. Small lots from store are quoted at 2 75¢ @ 3¢ for Machinery, 7.50¢ and upward for Tool and 7¢ @ 10¢ for Sheet

Steel Rails, Splice-Bars, &c.—Large orders for Rails are not coming forward at present, the local market therefore being decidedly quiet, with quotations maintained at $37 @ $37.50. Encouraging reports come from the East, however, and reported sales of Rails for export cause much satisfaction. Splice-Bars and Track-Bolts are moving freely and several round lots have been taken, for which sharp competition developed. Quotations are as follows: Soft Steel Splice-Bars, 2.25¢; Iron do., 1.95 @ 2¢; Spikes, 2.25¢ @ 2.30¢; Square-Nut Bolts, 2.80¢ @ 2.90¢; Hexagon do., 2.95¢ @ 3¢.

Old Rails and Wheels.—A sale of 700 tons of Old Iron Rails is reported at $26.50, Chicago. From 2000 to 3000 tons more were sold in various lots at about the same price at interior points. Old Steel Rails are in continued good demand, and sales have been made at $20.50 @ $21, with some discrimination as to length. Old Car-Wheels are quiet, with $20 named as the nominal price.

Scrap.—More demand is noted for some kinds of Old Material, but Wrought is still to be had in small quantities below dealers' regular prices. Steel Scrap is quite active. Dealers' selling prices are as follows, ℔ ton of 2000 lb: No. 1 Forge, $22; No. 1 Mill, $17; No. 2 Mill, $12.50; Car-Axles, $26; Fish-Plates, $23; Horse-shoes, $20.50; Pipes and Flues, $16; Cast Borings, $9.50; Wrought Turnings, $14; Axle Turnings, $15.50; Machinery Cast, $14.50; Stove-Plates, $11; Coil Steel, $17.50; Leaf Steel, $18.50; Tires, $19; Mixed Steel, $15.50 @ $15.75. They are paying $17.50 for Mixed Country Scrap.

Hardware.—Night work continues in the Shelf Hardware jobbing houses, with no immediate prospect of trade slackening up. Jobbers would not be displeased to have a lull of at least a couple of weeks to take stock, arrange for the coming year with traveling salesmen and lay out a plan of operations for the future. Prices are steadily moving upward. Shovel manufacturers have withdrawn outstanding quotations and advanced their rates 25¢ ℔ dozen, intimating that another advance is to be expected soon. Stove Hollow-Ware has been marked up, Ground now being 67 and 5 %, against the old rate of 65, 7½ and 5 %, and Unground 70 and 5 %, against 70, 12½ and 5 %. Manufactured Copper, in Sheets and Bars, has been advanced 2¢ @ lb. Common Carriage-Bolts, which were held at 70, 10 and 10 %, are now quoted at 70 and 12½ %. Manufacturers' agents are in receipt of inquiries for Machine-Bolts, Nuts, &c., on which their principals refuse to quote.

Nails.—Jobbers report the local market firm at $2.50 for Cut Steel Nails and $3.15 for Wire Nails from stock, with 5¢ off for carloads. Manufacturers are still quoting Cut Steel Nails at $2.25, at factory, and report light sales. Wire Nails, however, are being sold in large quantities at $2.90 @ $3 rates, at factory, by those willing to book orders for delivery in the first quarter of 1890. The majority of the manufacturers are pursuing a waiting policy in this respect.

Barb-Wire.—As reported by telegraph last week, manufacturers have raised the price of small lots of Painted to 3.35¢ and carload lots to 3.25¢, maintaining the usual advance of 60¢ ℔ 100 lb for Galvanized. Jobbers sell at the same rates. A heavy spring trade is expected, and manufacturers are predicting 4¢ for Painted by February 1. Wire-Rods have recently sold at $53.50, at Western works.

Pig-Lead.—Some slight movement was occasioned by purchases of 300 tons or more by consumers who had failed to receive expected shipments, but otherwise the market was quiet, though firm. On actual transactions 3.65¢ was realized, the week closing with 3.67½¢ @ 3.70¢ asked.

Philadelphia.

Office of *The Iron Age*, 230 South Fourth St., PHILADELPHIA, Pa., December 10, 1889.

Pig-Iron.—The market has not changed materially from last week, and in most cases prices are nominally as quoted at that time. But the fact is gradually becoming apparent that many of the leading companies who announced themselves as "sold up," "not quoting," &c., have recently in some mysterious way disposed of many large blocks of Iron. As a matter of fact all the large consumers have been arranged with, and quotations made hereafter will probably not be of much account, for the present at all events. Considering that the business has all been more or less of a confidential character, it would be manifestly improper to furnish the details, but it may be said that the figures are a good deal lower than would be inferred from current quotations. This, however, is no new thing. Indeed, as a rule, when the books are opened (to the public) regular customers have secured all they are likely to require, and on terms not to be named outside. There is nothing wrong in this, but the air of mystery and secrecy is apt to be misleading in times like these, particularly when the books are opened and a dollar or two of an advance in prices is announced. The truth of the matter is that whatever prices may be fixed by official utterance, a great deal of Iron has been sold for next year's delivery at $17, $18 and $19, at tide, with a guarantee of protection in case of a decline. However, as the big companies are out of the way for the present, prices may remain steady or they may advance a little, but there is no immediate probability of any important movement. On such a market and under such conditions prices are naturally very irregular. Some fair quality Irons can be had for $17, $18 and $19, delivered, in some cases a little less, but as a rule strictly desirable brands are quoted at at least 50¢ more money and in other cases $1 more, while very choice No. 1 is quoted $20.50 and No. 2 $19. These quotations cover a wide range, of course, but there is a considerable difference in qualities, and in some cases almost as much difference in the opinions which sellers hold in regard to the course of the market. Except in the way we

have stated (viz., private arrangements), the volume of business has been very small, so that it is difficult to say whether the market is firm or the reverse. Probably the best definition would be to call it dull and prices unsettled.

Foreign Iron.—Spiegel now held at about $36.50, c.i.f., duty paid, for 20 % and 80 % Ferromanganese at $100. There is a good deal of inquiry, but no sales have been reported during the week.

Blooms.—Charcoal, $53 @ $55; Run-out Anthracite, $43 @ $45, and Scrap Blooms, $34 @ $35 ℔ Bloom ton.

Billets.—Steel Billets are again held at an advance—say $36 @ $37, delivered, for Nail Slabs and $37.50 @ $38 for Sheet or Tank purposes. Sales have been made during the week at inside figures, but an advance of 50¢ ℔ ton is now asked.

Muck-Bars.—The market has been very firm during the week, and a great many holders ask at least $1 advance over last week's prices Sales have been made at $30.25 @ $30.50, at mill, and in one case $31.50, delivered Philadelphia, but $30.75 @ $31, at mill, appears to be the general asking price to-day.

Bar-Iron.—The market cannot be called active, although there is a heavy consumption going on and mills are pretty well crowded to keep up with deliveries. There is a fair inquiry, but at 1.95¢, which is the usual sea board quotation, buyers seem in no hurry to take hold. However, there is usually a falling off in the demand toward the close of the year, so that manufacturers are not in the least disturbed by temporary dullness, especially as there is plenty of business to go on with until the holidays commence. Prices are steady at from 1.95¢ to 2¢ for best Refined Bars, and so far as we can learn there is no disposition to shade these prices, although some of the country mills are said to be quoting 1.82½¢ @ 1.85¢, f.o.b. cars at mills. Skelp is dull at 1.90¢ asked for Grooved and 2.15¢ @ 2.20¢ for Sheared, but there is no disposition to take hold at these figures, as consumers' requirements seem to be provided for for the present.

Plates.—There is quite a good inquiry for Plates of all descriptions, but nothing important has been closed recently. The mills are ful. of work, however, so that no uneasiness is felt in regard to the future. Prices for Iron Plates are firm, but Steel appears to be getting higher all the time, there being fully 20¢ to 25¢ difference between Iron and Steel. Prices are about as follows: 2.30¢ @ 2.35¢, delivered, for Ordinary Iron Plates and Tank-Plates; 2.40¢ @ 2.45¢ for Universal Plates; Shell, 2.6¢ @ 2.7¢; Flange, 3.25¢; Fire-Box, 3.75¢ @ 4¢; Steel Plates, Tank and Ship Plate, 2.50¢ @ 2.60¢; Shell, 2.75¢ @ 2.8¢; Flange, 3.15¢ @ 3.20¢; Fire-Box, 4¢ @ 4½¢.

Structural Material.—There is nothing new on the market at present, but mills have a great deal of work on hand, so that there is no urgency for new business. The amount of work under contract insures full employment for the winter months and is also a guarantee of firm prices, which are about as follows: Bridge-Plate, delivered, 2.35¢ @ 2.40¢; Angles, 2.30¢ @ 2.35¢; Tees, 2.7¢ @ 2.8¢; Beams and Channels, Iron and Steel, 3.1¢; Steel Plates and Angles range from 20¢ to 30¢ higher than the same in Iron.

Sheet-Iron.—There is a good demand for all descriptions, and mills are constantly pushed to keep up with deliveries. Stocks are reduced to a minimum, so that prices, which for carload lots are as follows, are firmly maintained:

Best Refined, Nos. 14 to 20	3.10¢
Best Refined, Nos. 21 to 24	3.30¢
Best Refined, Nos. 25 to 26	3.50¢
Best Refined, No. 27	3.60¢
Best Refined No. 28	3.70¢

Common, ¼¢ less than the above.

Best Soft Steel, Nos. 14 to 20	3¼¢
Best Soft Steel, Nos. 21 to 24	3¾¢
Best Soft Steel, Nos. 25 to 26	3¾¢
Best Soft Steel, No. 27	4½¢

Best Bloom Sheets, ¼¢ extra over the above prices.

Best Bloom, Galvanized, discount	62½ %
Common, discount	65 %

Steel Rails.—The movement is not heavy, but prices are held with great firmness at $35 at mill. A few fair-sized lots have been taken on that basis, but the aggregate is not large. There is a good deal of inquiry, however, and the trade expect some valuable accessions to their order-books before long.

Old Rails.—The supply of Rails in this vicinity seems to be pretty well exhausted, and lots in the interior command very little more than at sea-board. Lots for shipment from abroad are held at $28, with buyers at $27.50, and some probability of business being closed for several thousand tons at a medium figure. Sales of small lots at from $27 to $27.50, delivered at mills in the interior.

Scrap-Iron.—The supply of Scrap is much below the demand, so that prices are firm at the outside figures here quoted: No. 1, $24 @ $25 for carload lots, delivered; or for choice, $25.50; No. 2 do., $17 @ $18; Turnings, $16 @ $17; Old Steel Rails, $20 @ $22; Cast Scrap, $15.50 @ $16.50; do. Borings, $11 @ $12; Old Fish-Plates, $27 @ $28.

Nails.—There is not much business doing at present, but prices show great steadiness at about $2.20 for Iron and 15¢ @ 20¢ more for Steel.

Cleveland.

CLEVELAND, December 9, 1889.

Iron Ore.—The excitement in Ore circles continues unabated. The multitude of agents in this city are simply overwhelmed with orders, and estimates of the actual sales made during the past week or ten days for 1890 delivery vary from 2,000,000 to 4,000,000 tons, with a probability of the former estimate being nearer the truth. All this has been done without the customary ceremonies hitherto tacitly observed of formally fixing prices before sales of any importance are made. The Republic Company have generally led the way, but now, although sales of Republic Ore at $7 are not denied, the company have fixed no formal quotation. Gogebic Ores are selling freely at $5.50 @ $6. Chapin and other Menominee Bessemers are bringing $5.50, f.o.b. vessels Cleveland. Non-Bessemer Ores are not yet in demand. Charters have already been made providing for the transportation of at least 4,000,000 tons of Ore. The final figures for 1889 correspond almost exactly with the estimates given in these columns two or three weeks ago. The total receipts at lower lake ports for the season aggregate 5,325,000 tons, as against 3,785,000 tons last year. The amount of unsold Ore now on the docks is less than 70,000 tons.

Pig-Iron.—One of the peculiar conditions of the market is the change in the relative quotations for Bessemer and Lake Superior Charcoal Irons. Under ordinary conditions the latter command from $2 to $2.50 more ℔ ton than is demanded for Bessemer. Quotations are now exactly reversed. During the past week $23, cash, at the furnaces, has been paid for Bessemer, while 2000 tons of Lake Superior Charcoal brought only $21.10, f.o.b. cars at Sharon. This is explained in a measure by the faith of the Steel manufacturers in the stability of the market, while very little is being done by Car-Wheel manufacturers. The whole market is, however, remarkably strong. The furnace men are too overcrowded with orders to honor any inquiries for Iron for immediate delivery. Prices are steadily advancing, and there is every indication of $23.50 @ $24 being paid for Bessemer before the close of the week. Stocks have dwindled away to almost nothing.

Old Rails.—The market is not active. Sellers demand $27.50 @ $28 for Old American Rails. Scattering sales are reported at the former figure.

Manufactured Iron.—There is an almost alarming scarcity of Sheet-Iron. Prices are based upon 3.25¢ for No. 27. The inquiry for Common at 1.80¢ @ 1.85¢ is exceedingly strong.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, December 9, 1889.

Pig-Iron.—The condition of the market so far as can be ascertained is rather more conservative than it was a week or ten days ago. If the question of reliable and speedy transportation were solved a great strain that is now being felt would be very much relieved. As it is now, however, consumers cannot depend with certainty upon getting their stock and are obliged to avail themselves of the nearest Iron that they can command and consequently have to pay higher price. So far as prices are concerned from first hands there has been no particular advance, in fact, when parties are willing to take the Iron on the furnace bank and run their own risk as to the time the Iron could be delivered. In a number of instances $16 for No. 1 could be shaded to some extent, although a basis of this price may be said to be a very firm figure, and the general idea prevails that this will be the figure for the balance of the year. There have been a few small lots of No. 3 Foundry sold at $14.75 @ $15, which is considered the top of the market, and it is doubtful if large round lots could be sold at quite that figure. To sum it all up, the market shows a strong but conservative feeling.

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, December 9, 1889.

Pig-Iron.—The market is rather quiet, but not materially different from what it was a week ago. Prices continue to show the strength which has characterized the market for the past three months. The demand is somewhat restricted on account of the recent advance, but the current orders for small lots, in conjunction with deliveries on former contracts, prevent any chance of accumulation. Consumers who have been waiting for the customary December slump in prices are in a fair way to be disappointed, for taking the facts into consideration as stated above, it is very apparent that present quotations will be sustained, and in all probability the increased demand which is likely to occur after the first of the year will force values still higher. Southern Charcoal No. 1 has been advanced from $18.50 to $19, and No. 2 from $17.50 to $18, at which prices several fair-sized lots have been booked. Inquiries are being received for round lots at from 50¢ to 75¢ below the prices quoted herewith, showing a want of Iron by consumers who appear unwilling to pay the advance prices, but as no furnace can be found willing to take such orders, it is only a question of time when the prospective buyers will be forced into the market, as it is generally understood that with the exception of one or two large concerns, stocks in consumers' hands are reaching a low ebb. For ordinary-sized lots we quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry,	$19.00	@	$19.50
Southern Coke, No. 2 Foundry,	18.50	@	19.00
Southern Coke, No. 3 Foundry,	18.00	@	18.50
Gray Forge	17.50	@	18.00
Ohio Softeners	19.00	@	19.50
Lake Superior Charcoal	22.00	@	23.00

Missouri.

Charcoal Foundry, No. 1	18.50 @	19.00
Charcoal Foundry, No. 2	17.50 @	18.00

Tennessee.

Charcoal Foundry, No. 1	19.00 @	19 50
Charcoal Foundry, No. 2	18.00 @	18.50

Connellsville Coke, f.o.b. East St. Louis, $5.25; St. Louis, $5.40.

Bar-Iron.—The demand has fallen off somewhat, but mills are well filled with orders and prices are strictly adhered to. We quote as follows: Lots from mill, 2¢; small lots from store, 2.10¢ @ 2.15¢.

Barb-Wire.—Notwithstanding the lateness of the season trade keeps up remarkably well. The advance made on December 1 is maintained by the mills, which are, generally speaking, well filled with orders and have no reason for quoting lower prices. Occasionally small lots are reported at figures less than those quoted herewith, but these sales have no effect on the general market. The following prices are quoted: Painted, from 3.30¢ to 3.35¢; Galvanized, from 3.90¢ to 3.95¢; carload lots, 10¢ ℔ 100 lbs less than above prices.

Louisville.

LOUISVILLE, KY., December 9, 1889.

The market has been quiet during the past week, as local consumers have bought what Iron they desire for some time to come and do not anticipate buying largely unless some change should take place in the market. Iron has been offered more freely by Southern furnaces than in the past, and some of the largest companies are quoting for delivery during six months of next year on basis of $14, cash, cars furnace, for Gray Forge. As these prices are much higher in proportion than those ruling East and at Pittsburgh, it is not thought that any further advance will take place until prices in other sections of the country have increased. Buyers believe that prices next year will be much higher, but do not look for any advance before February.

Southern Coke, No. 1 Foundry (new classification)	$18.25 @	$18.75
Southern Coke, No. 2 Foundry (new classification)	17.75 @	18.25
Southern Coke, No. 3 Foundry (new classification)	17.25 @	17.75
Gray Forge	16.75 @	17.25
White and Mottled, different grades	15.50 @	16.50
Silver Gray, different grades	16.25 @	17.25
Southern Charcoal, No. 1 Foundry	18.50 @	19.50
Southern Charcoal, No. 1 Mill	17.00 @	17.50
Southern Car-Wheel, standard brands	23.50 @	24.50
Southern Car-Wheel, other brands	19.25 @	21.75
Hanging Rock Coke, No. 1 Foundry	18.50 @	19.00
Hanging Rock Charcoal, No. 1 Foundry	22.00 @	22.50
Hanging Rock, Cold Blast	24.00 @	26.00

Birmingham.

BIRMINGHAM, ALA., Dec. 9, 1889.

The Iron market is more satisfactory this week than for many months. Prices are a bit better than last week. Furnaces are filling present orders steadily and showing no inclination to sell much ahead. Confidence is general that even higher prices must prevail, and this tone of hopefulness is being imparted to all trade in the district, and even real estate, which has suffered so long from the relapse of boom times, has commenced to resume renewed importance. Quotations, f.o.b. at the furnace here, are as follows:

No. 1 Foundry	$15.75 @	$16.00
No. 2 Foundry	15.00 @	15.75
No. 3 Foundry	14.50 @	15.00
Gray Forge	14.00 @	14.50

The indications of a large permanent improvement in the Iron situation are having effect upon those who are able to invest, and already within the past two weeks two 100-ton furnace projects have crystallized. One of these will be the property of a New Jersey company, the Vanderbilt (Geo. O.) Steel and Iron Company. Contracts were closed this week for the erection of their furnace at East Birmingham. It has been given out that this furnace will be specially constructed with a view to allowing a thorough test of the Pratt process of eliminating phosphorus from the Birmingham ores, the eliminating material to be blown directly through the tuyere-stocks into the furnace. The inventor, Dr. Pratt, is a Southern man, formerly State chemist of Georgia. Those interested with him here are confident that numerous successful small experiments he has made will bring the most satisfactory results on a furnace scale. The other furnace referred to is to be built by a company of local owners of coal and Ore lands near Trussville, 14 miles from Birmingham.

No. 1 furnace, of the De Bardeleben Coal and Iron Company, at Bessemer, went out of blast for repairs this week after an eighteen-months' continuous run. Of the three new furnaces about Bessemer which are practically completed, No. 1 of the Bessemer Steel and Iron Company and the Little Belle are being heated to go into blast; No. 2 of the former company will go into blast some time in January, so that by the 1st of February Bessemer, a three-year-old town of 8000 inhabitants, will have five furnaces in operation, all within half a mile of each other.

The rolling-mills at Gate City, Birmingham and Bessemer report better business than ever. The contrast in all Iron business in the Birmingham district with what has prevailed not long heretofore is decidedly favorable as regards the present outlook. There is undaunted conviction in the minds of many practical, intelligent people here that the basic or some kindred process will in the near future solve the problem of making Steel out of Alabama Ores. The greatest interest is manifested here in the result of the sale of Talladega Bessemer Iron to Carnegie's Steel-works, at Pittsburgh, and Iron men are confident of favorable analysis of the Talladega furnace products.

Iron men are not near as squeamish now as formerly—that is, as they were in the incipiency of the Iron industry in Alabama. One conservative master said to your correspondent: "I do not mind saying that my Iron costs me $10.50 per ton, including every possible item, charity and all, and I buy all my raw material. I am selling it at the furnace for $16—that is, for No. 1 Foundry." This is the grade of Iron which this furnace has nearly always made. An instance was then given of another furnace typical of the rest, the operators of which mine their own coal and Ore on their own lands, where the cost was stated to be not more than $8.50 a ton. One of the Bessemer furnaces is said to be making now not less than $7 ℔ ton profit. There is no doubt in the minds of the well-informed that the handsome earning capacity of the six furnaces of the Tennessee Coal, Iron and Railroad Company, two here and four at Ensley City, has had much to do with the recent rise in the stock of that company. General Manager Bond, of that company, has also been making Steel experiments by a process to all appearances similar to the Pratt, and seems to be quite hopeful of success.

Detroit.

WILLIAM F. JARVIS & CO., under date of December 9, say: The local market has been very dull for the past week, and the absence of any large trading leaves very little of interest to report. There is one feature, however, and that is prices are firmer and on some grades higher also, notwithstanding the fact that sales have been small. The majority of buyers are willing to wait until after the first of the year to place further contracts. With a quiet but firm market we quote as follows:

Lake Superior Charcoal, all numbers	$21.00 @	$21.50
Lake Superior Charcoal Bessemer	21 00 @	22.00
Lake Superior Coke Bessemer	22.50 @	22.75
Lake Superior Coke Foundry, all ore	20.00 @	21.00
Lake Superior Coke, cinder mixed	18.25 @	18.75
Standard Ohio Blackband	20.00 @	21.00
Southern No. 1	18.25 @	18.50
Southern Gray Forge	16.25 @	16.50
Southern Silvery	16.50 @	17.00
Jackson County (Ohio) Silvery	19.25 @	19.75
Old Car-Wheels	19.00 @	19.75
Old Iron Rails	25.00 @	25.50

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts.,
CINCINNATI, December 9, 1889.

Pig-Iron.—The new phases in the local market noted in last Wednesday's telegram are still in force at the moment of writing. The demand is active for both Forge and Foundry grades of Coke Iron of both Northern and Southern production. In fact, the demand for Forge Iron is urgent in some quarters, and sales of Gray Forge have been made at an advance of 25¢ ℔ ton. Foundry grades have been strong at the prices noted in the telegram, which are about 50¢ ℔ ton higher than quoted a week ago. So far as can be determined, there has been no change in the statistical position since the last review, but buyers have tested the market more fully and now more generally recognize the strength possessed by sellers. Car-Wheel Iron has been especially strong and active. The Southern make has not advanced, but Lake Superior Iron, which has been relatively low, has been advanced $2 ℔ ton. Northern furnaces have been under such a pressure that not a few stacks have been able to secure higher prices, making another advance on Southern Iron easier. The recent transactions have been largely of Southern manufacture and have embraced the first four months of next year. Among the larger sales are 1000 tons Southern Coke, Gray Forge, at $17.65, 1000 tons do. at $17.50, 1000 tons do. at $17.75, 1000 tons Southern Car-Wheel at $24.50, and at the close one lot of 5000 tons, mainly of Southern Gray Forge, has about been contracted for on the basis of $17.65 for January to March delivery. It may be that some of these sales have been effected, the buyers securing the old freight rate, and if so the advance in prices may be more apparent than real. Charcoal-Iron has improved some in tone, but there has been no advance in prices. The current prices here at the close, cash, f.o.b., are as follows:

Foundry.

Southern Coke, No. 1	$19.00 @	
Southern Coke, No. 2	18.50 @	
Southern Coke, No. 3	18.00 @	
Ohio Soft Stone Coal, No. 1	18.00 @	$19.00
Ohio Soft Stone Coal, No. 2	17.50 @	18.00
Mahoning and Shenango Valley	18.00 @	
Hanging Rock Charcoal, No. 1	20.00 @	22.00
Hanging Rock Charcoal, No. 2	19.50 @	21.50
Tennessee and Alabama Charcoal, No. 1	19.00 @	19.50
Tennessee and Alabama Charcoal, No. 2	18.00 @	18.50

Forge.

Gray Forge	17.50 @	17.75
Mottled Neutral Coke	16.50 @	17.00

Car-Wheel and Malleable Irons.

Southern Car-Wheel	24.00 @	24.50
Hanging Rock, Cold Blast	22.00 @	25.00
Lake Superior Car-Wheel and Malleable	22.75 @	23.00

Old Material.—A further advance has been asked for Old Rails, with a fair inquiry. It is now difficult to obtain Northern Rails under $28, and Southern Rails of standard weight are quotable at $27, but there have been further small sales of light Rails (35 lb) at $26.25, cash, here. There has been more demand for Old Wheels, with sales at $19.25, cash.

Nails.—There has been some demand and a steady market. Iron and Steel Nails, 12d to 40d, sell at $2.35 @ $2.45 ℔ keg, with 10¢ rebate in car lots, at mill; 50d to 60d at 25¢; 10d, 10¢; 8d and 9d, 25¢; 6d and 7d, 40¢; 4d and 5d, 60¢; 3d, $1, and 2d, $1.50 ℔ keg more; Steel Wire Nails sell at $3.10 @ $3.20 for 60d.

Manufactured Iron.—There has been but little, if any, improvement in the demand for either Bar, Sheet or Plate Iron, and prices are unchanged, but a more confident tone prevails.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, December 10, 1889.

The most unsatisfactory feature connected with the Iron and Steel interests is the difficulty in getting prices of the products up fast enough to correspond with the increased cost of raw material. For some months past this has been simply impossible, and to-day all kinds of finished material is much cheaper relatively than the raw article, but the indications are that all kinds of finished Iron and Steel will be advanced within the next few weeks. A great many buyers realizing this are now placing their orders. Some manufacturers are refusing to contract ahead at present prices; they are booking orders with the understanding that they are to get market price at the time of delivery.

Pig-Iron.—We have to report a continued strong and active market, and there is every indication of still higher prices. The advices from the Lake Superior districts state that already 60 % of the Ore produced in those districts has been placed for the coming year, and that, too, at an advance of $1 ℔ ton above the ruling price of the time last year, when buyers generally were holding off or buying only as their immediate wants required. This is having its effect on the Pig-Iron market, as with dearer Ores the price of Coke is likely to be further advanced. With the cost of production constantly on the rise, there must be a corresponding advance in the price of the product. Attention has been called to the fact that there is much more difference in the price of Bessemer and Mill Irons than formerly, and furnace men working on the latter say the price should be from $1.50 to $2 ℔ ton more in order to be on a par with Bessemer. However, there is a greater demand for the latter than the former, and has been for several months past, and while this continues it is more than likely to command the most money. Thus, while Mill Irons have advanced $4 @ $4 50 ℔ ton as compared with the lowest point at which they were sold this year, Bessemer has advanced during the same time from $7 to $7.50 ℔ ton. The activity of the past three weeks was generally unlooked for. December being the last month of the year should be one of comparative quietness, but brokers report that there is no difficulty in effecting sales; that the greatest trouble is to get the Iron to sell. There is not a furnace in this district that is not sold from two to four and even six months ahead, and the general position of the market is as strong as ever, with every indication of still higher prices. We quote as follows :

Neutral Gray Forge	$18.00	@ $18.50,	cash
White and Mottled	16.50	@ 17.50,	"
All Ore Mill	18.50	@ 19.00,	"
No. 1 Foundry	18.50	@ 19.00,	"
No. 2 Foundry	18.00	@ 18.50,	"
No. 1 Charcoal Foundry	23.50	@ 24.00,	"
No. 2 Charcoal Foundry	21.50	@ 22.00,	"
Cold Blast Charcoal	25.00	@ 28.00,	"
Bessemer Iron	23.50	@ 24.00,	"

It is rumored that sales of Bessemer for spring delivery have been made at $25, cash, and we doubt if a furnace man could be found who would be willing to sell for April or May delivery under that price. It looks very much as if Bessemer would go to $25 and Mill to $20 before the upward tendency is arrested.

Muck-Bars.—There is an improved demand, especially for delivery during the first quarter of next year, and prices are higher. We can report sales of 2500 tons for January, February and March delivery at $31 @ $31.50, cash, and it is doubtful whether additional purchases could now be made for the months named at the prices quoted. In view of the shortage of the supply of natural gas, it is thought that there will be an increased demand before long. It is claimed, also, that taking present prices of Pig-Iron and Muck-Bar as a basis, the margin for profit is small. Some firms here are giving considerable attention to the Muck-Bar trade; they furnish the Pig-Iron and pay so much per ton for having it converted into Muck-Bar.

Manufactured Iron.—The market for all kinds of Manufactured Iron is firmer, and it is evident will have to go still higher. Bars are now quoted at 1.85¢ @ 1.95¢; Plates, 2.35¢ @ 2.40¢; No. 24 Sheet, 3¢ @ 3.10¢; Skelp-Iron, 1.80¢ @ 1.85¢ for Grooved and 2.15¢ @ 2.25¢ for Sheared. Structural Iron: Angles, 2.45¢; Tees, 2.95¢; Beams and Channels, 3.10¢; Sheared Bridge-Plates, Steel, 2.85¢; Universal-Mill Plates, Iron, 2.55¢; Refined Bars, 2¢; Tank-Iron, 2.40¢ @ 2.45¢ for Iron and 2.65¢ @ 2.75¢ for Steel.

Nails.—Cut Steel Nails are still quoted at $2.25, 60 days, 2 % off for cash, in a small way to regular customers, but contracts cannot be made for future delivery at the price quoted; manufacturers say that Nails should be not less than $2.50. Usually trade is always light in December, but many jobbers would like to contract now, because they are apprehensive of higher prices early in the new year, if not before. Carnegie, Phipps & Co. reduce their quotation on Wire Nails to $3 rates, a reduction of 10¢ ℔ keg.

Wrought-Iron Pipe.—There is not so much new business, but the mills have all they can do, and this will no doubt continue until the close of this year. The present year has been one of the best the Pipe manufacturers ever had, which may be attributed in large part to their excellent organization. No change in prices. Discounts on Black Butt-Weld Pipe, 50 %; on Galvanized do., 42½ %; on Black Lap-Weld, 62½ %; on Galvanized do., 50 %; Boiler-Tubes, 1¼-inch and smaller, 50 %; on 2-inch and larger, 55 %; Casing, 5½ inch, 55 %.

Old Rails.—Old Iron Rails are firmer and higher; sale 1000 tons at $28, showing an advance of $1 ℔ ton within the past few weeks. The stock is light, and some of the best posted dealers look for still higher prices early in the new year, if not before. Old Steel Rails are firmer and holders look for still higher prices; may be quoted at $22.50 @ $23.50.

Railway-Track Supplies.—For the present demand is light, but prices are firmer and likely to be advanced early in the new year. Spikes remain unchanged at $2.15, 30 days, here and $2.25 at Chicago, Milwaukee, Cincinnati and St. Louis. Splice-Bars, 2¢; Track-Bolts, 3.10¢ with Square and 3.20¢ with Hexagon Nuts.

Steel Rails.—Heavy sections are quoted at $35 @ $36, cash, at mill. The price will have to go still higher unless the cost of Bessemer Pig is checked or reduced, of which there is not much prospect at present.

Merchant Steel.—There is a very fair demand and prices are firm, with every indication of going still higher. Tool Steel, ordinary grades, 8¢ ℔ lb; Crucible Spring Steel, 4¢; Crucible Machinery, 5¢; Open-Hearth Steel, 2¼¢ @ 3¢; Bessemer Machinery Steel, 2¼¢ rates, Tire Steel, 2.3¢ ℔ lb.

Wire-Rods.—Market active and prices firm at $52 ℔ ton.

Old Material.—There is an increasing demand for almost everything in this line and prices are firmer. We now quote: No. 1 Wrought Iron, $22 @ $22.50, net ton; No. 1 Wrought Turnings, $15 @ $16; Old Car-Axles, $27 @ $28; Cast Scrap, $15.50 @ $16, gross; Car-Wheels, $20, gross; Steel Bloom and Rail Ends, $22.50 @ $23.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, December 11, 1889.

American Pig.—Current business is confined to small lots of Foundry Iron for early delivery at $19 @ $19.50 for No. 1. So far as we can learn there is very little business doing for 1890 delivery thus far, although some Southern furnaces report some sales at their prices, among them one lot of 3000 tons. The majority of sellers are unwilling or unable to name prices, while buyers, particularly the smaller ones, are awaiting the announcement of opening prices. The gossip in the trade seems to point to $20 for No. 1 as the coming figure. Southern Iron continues to move slowly, and no great improvement is expected until the cotton season is over. A good many founders have still cheap Iron to come, so that the present scarcity is more apparent than real. Our blast-furnace report shows a further increase in the capacity at works. As indicative of the wide differences in prices in different parts of the country we may note that 3000 tons of Gray Forge sold in Western Pennsylvania at $17.85, delivered, while in the Harrisburg district $16.50 is quoted at furnace. There are a good many rumors of large transactions in Bessemer Pig in the East, but no definite information is available; $21 at furnace has been declined for the entire 1890 product of an Eastern furnace, and $22 at furnace is now being quoted by Eastern makers, without any reports of sales at that price, however.

Spiegeleisen and Ferromanganese.—There have been further heavy sales of Spiegeleisen, the aggregate with those alluded to in our latest issue being above 20,000 tons, the bulk of it for delivery during the second quarter of 1890. For that delivery importers now quote $36.50 @ $37 for 20 % and about $45 for 30 %. A small lot of Ferromanganese was offered early in the week at $90.

Billets and Slabs.—No business of any consequence is reported. From Wheeling come reports of an advance to $36, at mill, and of sales as high as $37, the latter not being confirmed.

Wire-Rods.—The market has advanced further. For spring delivery an Eastern mill has offered at $55.50, New York. Foreign are nominal at about $56.

Steel Rails.—The only reported transaction of consequence is a lot of 10,000 to 13,000 tons to a Southern road, by a Pittsburgh mill; at private terms. In the East there has been a resale of one lot of 3500 tons at $34, and there are now only a very few outside lots in the market. A number of mills report sales of moderate lots at $35, the aggregate being about 10,000 tons. The Eastern mills are now all of them asking $35. Opinions in the Rail trade are divided on the question of a large consumption next year. Some report that even now there are evidences of a very large demand. Others do not expect more than a moderate consumption.

Manufactured Iron and Steel.—A Western Pennsylvania mill reports a sale of 1500 tons of Refined Bars to a leading railroad at 2.05¢, delivered. Structural Iron makers note no sales of any magnitude. As showing that the difference be-

tween Iron and Steel Plates is beginning to tell, we may note that a large Ship-Plate order in the market calls for Iron. We quote Iron Universal Mill and Tank Plates 2.25¢ @ 2.30¢, while Iron Angles are 2.25¢ @ 2.3¢; Tees, 2.75¢ @ 2.8¢, and Beams and Channels 3.1¢, on dock.

Old Rails.—The only business reported are two small lots, one foreign, early arrival, and one American, at $26.75.

Scrap-Iron.—There is very little doing, buyers and sellers being apart. We quote nominally $23 @ $23.50, in yard, for No. 1.

Financial.

In financial circles Secretary Windom's presentation of the silver question has been of absorbing interest. The Secretary proposes to issue Treasury notes against the deposit of silver bullion at its market value when deposited; to make these notes receivable for customs, internal taxes and all public dues and to make them redeemable, at the option of the Government, in gold coin or in silver bullion at the market price on the day of redemption, or in silver dollars if the holders prefer these. Mr. Windom's plan creates a note which will be at all times worth par in gold, because the holder can always get for such a note the value of silver its face calls for in the open market. The *Financial Chronicle* derives satisfaction from the fact that under the proposed scheme silver coinage would cease, and is of the opinion that it is the best substitute for a corner which the United States Treasury alone must support. Director of the Mint Leech is far more hopeful, believing that Secretary Windom's measure will open "a ready market for the surplus silver product of the world;" not only this, but it would "permanently enhance the value of silver," so as to admit of an international agreement.

Stocks this week have partly recovered from the previous depression, and the trusts, which, since the recent squeeze, represent more nearly the market value, were a prominent feature. Sugar was influenced by the declaration of its 2½ % dividend, making 22½ % in cash and 8 % in stocks distributed in dividends in about two years. Large offerings to the Treasury of bonds by depositary banks yesterday encouraged expectations of easier money, and this prospect and buying of the railroad list by domestic and European traders had a strengthening effect. The unfavorable bank statement had little influence. On Monday the market was dull and irregular. Coal stocks were affected by the unsatisfactory condition of the coal market and the open winter. Lackawanna dropped on the announcement of the death of Harvey Kennedy, it being assumed that his large holdings would be thrown on the market. On Monday there was a sharp break in the Sugar Trust, and the Chicago Gas Trust was next in weakness. Union Pacific advanced on a report of extraordinary earnings on the business of the last three months. At the close tight money affected the whole list, but it was conceded that the squeeze was artificial and temporary.

United States bonds were quoted as follows:

U. S. 4½s, 1891, registered	104½
U. S. 4½s, 1891, coupon	104½
U. S. 4s, 1907, registered	126
U. S. 4s, 1907, coupon	127⅛
U. S. currency 6s, 1895	115
U. S. currency 6s, 1896	117½

State bonds were active at generally advancing prices.

The total capitalization of the Sugar Trust, Cotton-Oil Trust, Chicago Gas Trust and the Lead Trust, according to Henry Clews, is something over $200,000,000. Of these Sugar Trust is the only one which has ever sold above par. It reached 129 last June, but since that it has dropped 74 points, representing a shrinkage in value of very nearly $40,000,000. The entire shrinkage in value in the four principal trusts has been $72,566,102.

Money has been distinctly easier since it has become apparent that no disturbance would follow the Secretary's call for 10 % of Government deposits in national banks. Instead of contraction, several banks now holding deposits are said to contemplate an increase of their note issues by utilizing the bonds now held to secure deposits as a basis of circulation. Time loans were quoted at 6 % for 90 days to seven months on really first-class collateral. Commercial paper was in a little better demand from buyers in the interior, and rates were 6 % for 60 to 90 day indorsed bills receivable and 6½ @ 7½ % for good single names having from four to six months to run. The bank statement showed a loss of $1,188,700 in surplus reserve, bringing that item down to $703,150. Loans were contracted $1,771,900.

The market for sterling exchange was quiet but firm; posted rates, $4.81 @ $4.85½. Silver declined on the Secretary's recommendation to issue certificates to represent bullion. Gold importations are not looked for at present, although rates are near the point that would seem to warrant such a movement.

In general merchandise the markets have a healthful tone, and in special lines the activity is quite noticeable, much of it in preparation for the holidays. Raw sugar has been bought heavily. Spreckels is said to have secured nearly 4000 tons, and competition by the Sugar Trust caused an advance of ¼¢. Clapp & Co. say of wheat: "The movement of winter wheat the past three weeks has been nearly 40 % greater than same time last season, while of spring and winter it is nearly double. Exports the past week have been nearly three times those of same time last year, largely of flour. Our total receipts of wheat since July 1 to date have been nearly 82,500,000, against less than 65,500,000 last year and 75,500,000 in 1887. The exports for November last were 5,080,000 bushels wheat and flour, against 2,387,000 last year, 8,700,000 for 1887 and 13,000,000 same time in 1886." In Baltimore nine steam-ships were chartered in a single day to load for Europe. Coffee was without stimulus. Teas offered at auction in large quantities demoralized the market. In dry goods the failure of Whitney & Co. was announced, with liabilities reported at $500,000. Business failures number 316, as compared with 305 for the corresponding week last year.

The clearings of 43 cities for the week show an increase of 8.2 % compared with the same week last year. For 11 months New York shows a gain of 16.4, Boston 25.5, Philadelphia 14.4, Chicago 6.7, St. Louis 10.4 and Fort Worth 106.9 %.

Exports of merchandise from New York for the week were valued at $6,677,107 and the imports at $7,989,286. Total exports since January 1, $323,699,781; total imports, $467,721,949. For the entire country the foreign trade shows a favorable balance to November 1 of over $44,000,000, against an adverse balance of over $56,000,000 for the same time last year.

Coal Market.

The Anthracite Coal market is dull and unsatisfactory, and two failures in the trade tend to deepen the somber shades in the general outlook. The effects of the Consumers' Coal Company at their yards in this city were put up at sheriff's sale, and this event is followed by the serious embarrassment of the wholesale firm of Alpers & Swarthone, No. 1 Broadway, one of whose partners is missing, leaving the accounts in confusion. Rumor places the liabilities at something like $200,000. Excessive production and a mild winter are the two influences that tend to demoralization. Published statistics, represented to be correct, show that while the aggregate production of the seven Anthracite companies during the nine months ending September 30 is nearly 2,000,000 tons less than for the corresponding months in 1888, five of the large corporations have each exceeded last year's output to the average extent of 100,000 tons. The New York, Lake Erie and Western is increased 194,000 tons, even Jersey Central 174,000 tons, and Reading follows with 139,000 tons increase. Lehigh Valley's excess is put down at 45,000 tons. Quotations are those of the regular schedule, with $4.40 for Free Burning, f.o.b., as a basis, but actual selling prices are quoted as low as $4.

Bituminous Coal is scarce at unchanged prices.

A special dispatch from Middlesborough, Ky., reports the sale of 260,000 acres of Coal and timber land near that place to English capitalists, who, it is stated, contemplate the establishment of one of the largest Coal, iron and steel enterprises in America. The price is said to have been $1,500,000.

The New York and Scranton Coal Company, organized at Scranton, Pa., have bought and leased 8000 acres of Coal lands, and will work their mines as feeders to the new Ontario, Carbondale and Scranton Railway, which unites with the New York, Ontario and Western at Hancock. The capital is $1,000,000.

The Schuylkill and Lehigh Railroad route, now in process of construction, is nearing completion, and it is expected that trains will be running by next spring.

The Cameron Coal Company, it is reported, are to be reorganized.

The season of navigation on the Delaware and Hudson Canal has been a prosperous one.

The total shipment of Coal by canal from Honesdale has been in round numbers 1,000,000 tons, as against 930,000 tons last season. The shipments by rail, however, have fallen off 400,000 tons.

Metal Market.

Copper.—Since our last report the London market gave way from £49. 7/6, spot, to £48. 17/6 and futures from £49 @ £48. 10/ last night, closing again at £49. 10/ and £49. 5/ respectively to-day, sales aggregating 1200 tons. It is stated that bankers holding Lake Copper sold last week some millions of pounds up to 14¼¢. The nominal quotation to-day is 14¼¢ for Lake and 12¢ @ 12⅛¢, casting brands. A cable dated December 10 from Paris states that the Tribunal of the Seine has dismissed the claim of the Rio Tinto Mining Company for damages against the Société des Métaux. It has also refused to sanction the offer of the liquidators of the latter to rank the Arizona mines as creditors. The ten producing Lake Superior companies made a total output of mineral of 5671 tons in November, against 5576 tons by 11 mines in the same month last year. The October output was 5385 tons and the average for the first ten months of the current year was 4740 tons. The total product for the first 11 months was 53,567 tons by 12 mines, two of which are not producing at present, against 52,167 tons by 11 mines the same period last year. The November product figures full 8,000,000 lb of Fine Copper, and the 11 months' product is not far from 80,000,000 lb. The Boston and Montana will place its new issue of $500,000 bonds with the Barings at 95, less commission, by virtue of an agreement made about a year ago. The contract to

deliver Copper to the Barings will expire probably by June, 1890. A telegram from Butte, Mont., dated December 8, reads as follows: "Early yesterday morning the Anaconda shaft was opened, after being closed ten days. A dog was let down on the cage to the 800 level and when brought up lived only a few moments. Thirty minutes later another dog was let down to the 500 level and came up alive. The shaft of the St. Lawrence was opened and at 11 o'clock men went down and opened the bulkheads in the 100 and 600 levels. The shaft is free of gas, but steam and gas have come up the Anaconda shaft all day. The men are now at work in the 600 level of the St. Lawrence removing the dirt that has fallen down, so as to reach the dead bodies of the miners of the Anaconda. The steam injected into the mine has completely extinguished the fire which was in the 500 level of the St. Lawrence, but the extent of the damage is unknown."

Tin.—Spot Tin declined from £97. 17/6 on Thursday last to £96/5 and futures from £96. 12/6 to £95. 12/ last night, closing to-day at £96. 15/ and £96 respectively, sales amounting to 385 tons. Here the market has been steadily drooping from 21.30¢, spot, to 21¢, and futures in proportion, February and March selling at 21.05¢; total sales during the interval 100 tons. Spot Tin closes to-day at 21¢ @ 21¼¢. *Tin-Plates.*—Our market has been but moderately active for the week at unaltered quotations. We quote at the close, per box: Siemens-Martin Steel, Charcoal finish, $5.50 @ $6; Coke finish, $5.20 @ $5.25; Coke Tins, Penlan grade, $4.85; J. B. grade, $5, and Wasters, $4.75 @ $4.80.

Lead.—Sales did not exceed 200 tons, mostly Chemical, at 3.80¢ @ 3.85¢ which is also the closing quotation. The Western markets are quiet at 3.62½¢ @ 3.65¢, St. Louis, and 3.67½¢ @ 3.70¢, Chicago.

Spelter.—A fair demand has prevailed, leading to the sale of 200 tons Domestic at 5.35¢ @ 5.37½¢, the market winding up very firm at 5.35¢ @ 5.40¢. Silesian advanced to £24 in London, which would equal 7⅛¢ here.

Antimony.—We quote on an active market Cookson's at 31¢, and Hallet's, 22½¢.

New York Metal Exchange.

The following sales are reported:

FRIDAY, December 6.

25,000 ℔ Lake Copper, April.....14.00¢

SATURDAY, December 7.

10 tons Tin, spot.....21.20¢
10 tons Tin, December.....21.20¢

MONDAY, December 9.

10 tons Tin, December.....21.05¢
10 tons Tin, May.....21 15¢
25 tons Tin, December.....21.00¢

TUESDAY, December 10.

25 tons Tin, February.....21.05¢
25 tons Tin, March.....21.05¢

Imports.

Hardware, Machinery, &c.

Botany Worsted Mills, Mach'y, cs., 22
Boker, Hermann & Co., Mdse., 14
Clark, G. A. & Bro., Mach'y, cs., 15
Curley, J. & Bro., Cutlery, cs., 12
Frasse, P. A. & Co., Cutlery, case, 1
Field, Alfred & Co., Anvils, 30; Arms, cs, 4; Mdse., cs., 7
Graef Cutlery Co., Cutlery, cs., 7
Hartley & Graham, Arms, cs., 10
Merch. Desp. Co., Cutlery, case, 1
Morgan Engineering Co., Mach'y, pgs., 36
Newton & Shipman, Files, cks., 5
Oelrich & Co., Mach'y, pcs., 2
Schoverling, Daly & Gales, Guns, cs., 5
Silcox, G. W., Agricultural Mach'y, cs., 28
Sutcliff, John, Mach'y, pgs., 7
Ward, Asline, Mdse., cs., 3
Ward, Jas. E. & Co., Mach'y, pcs., 24; do., cs., 2
Wiebusch & Hilger, Lim., Anvils, 150; Mdse., cs., 22; Arms, cs., 3
Williams, G. R., Mach'y, cs., 3
Order—Hardware, cs., 15; Mach'y, pgs., 59; do., cs., 31

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, December 11, 1889.

The volume of business in Block-Tin has been large. Forwards were pressed for sale and several large lines closed out, which weakened the position of holders, who ran prices up early in the week on the strength of scarcity of spot stock, and £1. 10/ of the previous £2 rise was lost. Late dealings showed a weak and unsupported market.

The advance in Copper to £50. 5/ for Merchant-Bars, due to previous heavy purchases by consumers, caused buyers to hesitate, and this, in turn, prompted the "bulls'" profits. After a day of dullness the price weakened to £48. 10/ for prompts, subsequently improving £1 on renewed demands.

In Tin-Plate there has been little business, buyers' and sellers' views being far apart. Buyers are offering 15/6 for large lots of Bessemer Cokes, but makers decline all such bids and hold for 6d @ 9d more. The total stocks at British shipping ports are estimated at 409,000 boxes, against 233,000 boxes at the corresponding period last year.

Prices for Pig-Iron warrants have been very irregular and excited, although speculation shows less activity, and the purchases for consumption and export smaller. The fact of Middlesborough being higher than Scotch warrants is still the chief topic. The relatively high cost of the former is to a large extent stopping business and the shipment of Iron, besides acting as a check upon outside business in warrants. On makers' brands of Scotch Pig prices have ruled fairly steady, except in a few instances, but Middlesborough, while somewhat above the lowest point, is 3/ cheaper to-day than a week ago. Bessemer Pig continues strong, as does also Spiegeleisen, and prices for both have advanced. Steel Rails and Blooms are quoted 2/6 higher, but there has been no advance on other Steel.

Buyers of Old Material are less eager in their inquiries and business is moderate at present.

Reports from the Continent state that the demand there for Iron is increasing and that prices are still advancing. Makers are heavily booked.

Scotch Pig.—There has been a fairly active business in makers' Iron. Prices quoted somewhat lower on a few brands, but generally firm:

No. 1 Coltness,	f.o.b.	Glasgow	79/
No. 1 Summerlee,	"	"	78/
No. 1 Gartsherrie,	"	"	78/
No. 1 Langloan,	"	"	78/
No. 1 Carnbroe,	"	"	62/6
No. 1 Shotts,	"	at Leith	77/6
No. 1 Glengarnock,	"	Ardrossan	77/6
No. 1 Dalmellington,	"	"	70/
No. 1 Eglinton,	"	"	69/

Steamer freights, Glasgow to New York, 2/; Liverpool to New York, 10/.

Cleveland Pig.—The market more active to-day, and prices rather firmer. No. 3 Middlesborough quoted 61/6 for prompt.

Bessemer Pig.—There continues to be an active demand and makers' prices are higher. West Coast brands, mixed numbers, 77/6, f.o.b. shipping point.

Spiegeleisen.—The demand still active and prices higher and strong. English 20% quoted 97/6, f.o.b. at works.

Steel Rails.—Makers' prices are 2/6 higher and the market is strong at the advance and active. Heavy sections quoted at £7 and light sections £7/5 @ £7. 15/, f.o.b. at N. W. England shipping point.

Steel Blooms.—There has been a very good demand and the market is strong at 2/6 advance. We quote £6. 7/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—No further change in prices, but the market strong and fairly active. Bessemer, 2½ x 2½ inch, £6. 10/, f.o.b. at N. W. England shipping point.

Steel Slabs.—The market fairly active. Prices slightly irregular, but firm. Bessemer, £6 @ £6. 2/6, f.o.b. at N. W. England shipping point.

Old Rails.—The market has continued quiet and prices are unchanged. Tees quoted at £3. 7/6 @ £3. 12/6 and Double-Heads £3. 10/ @ £3. 15/, f.o.b.

Scrap-Iron.—There has been no change, the demand running light. Heavy Wrought quoted £3 @ £3. 2/6.

Crop Ends.—Sales moderate and prices without change. Bessemer quoted £3. 12/6, f.o.b.

Tin-Plate.—The market quiet and buyers and sellers apart. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	@ 18/
IC Bessemer Steel, Coke finish	16/3 @ 16/6
IC Siemens " "	16/6 @ 16/9
IC Coke, B. V. grade	15/9 @ 16/
Charcoal Terne, Dean grade	15/9 @ 16/

Manufactured Iron.—Black Sheets again 5/ higher and the general market firm and fairly active. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars	9	10	0	@	0	0	0
" Common "	8	0	0	@	8	5	0
Staff. Bl'k Sheet, singles	0	0	0	@	10	0	0
Welsh Bars (f.o.b. Wales)	7	12	6	@	7	17	6

Copper.—More business at the close and the market firmer. Chili Bars quoted at £49. 10/, spot, and £49. 5/ three months' futures. Best Selected, £57 @ £57. 10/.

Tin.—The market irregular, but showing more firmness to-day. Straits quoted at £98, spot, and £99. 15/ for three months' futures.

Spelter.—Demand very fair and the market quite strong. Quoted at £23. 17/6 for Ordinary Silesian.

Lead.—There has been a fair business. Prices steady at £13. 17/6 for Soft Spanish.

Foreign Markets.

EQUIVALENTS

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds
Kilogram	2.205
Picul	134.

CHILI.

VALPARAISO, October 11, 1889.—*Copper.*—The advance in Europe so far is not considerable enough to lead to a full resumption of output, hence producers have been holding back, and only 9873 quintals were sold at $16.30 @ $17.10, equaling £41. 9/4 in England. *Coal.*—Near-by cargoes are worth 33/ @ 34/ Newcastle and 29/ @ 30/ Australian; distant afloats of the former, 36/ @ 37/. *Exchange.*—90 days' sight, 25½d @ 25⅝d.—*Weber & Co.*

EAST INDIES.

MANILA, December 2, 1889.—*Hemp*—Is firm at $14.62½ ℔ picul, against $11.62½ same date

last year, equaling ₱ ton, cost and freight, £46. 5/, against £40. 7/6. There have been no clearances from the United States since last cable, while last year same time there were 7000 bales; since January 1 there have been 174,000 bales, against 229,000 in 1888, while there remain loading 32,000, against 22,000; cleared for England since January 1, 297,000 bales, against 235,000; loading for ditto, 4000, against 8000; cleared for all other countries, 46,000, against 66,000; receipts at all ports since last cable, 8000, against 8000; since January 1, 527,000, against 608,000 and 501,000 in 1888 and 1887. *Freight.*—$5.50, against $7. *Exchange.*—Six months' sight on London, 3/5¾, against 3/7¼,—*Ker & Co., per cable direct to their agent in New York, Mr. Charles Nordhaus, 89 Water street*

COLOMBO, CEYLON, October 31, 1889.—*Plumbago.*—The market has continued displaying much firmness; we quote at the close in rupees ₱ ton: Large Lumps, 220 @ 250; Ordinary Lumps, 200 @ 230; Chips, 115 @ 135, and Dust, 85 @ 100. *Ebony*—May be quoted 150 @ 200 rupees ₱ ton. Plumbago shipments have since the 1st inst. been distributed as follows: To England, 8003 cwt.; against 10,749 last year; to the United States, 5784, against 3356, and to Hamburg last year, 851; together 13,787 cwt., against 14,956 in 1888. *Exchange.*—Six months' sight on London, 1/5½.—*Volkart Bros., Ceylon and Malabar Coast, through their agent, John W. Greene, 82 Wall street New York.*

SPAIN

BILBAO, November 23, 1889.—*Iron Ore.*—Spot dealings have been light, owing to little Ore available. Rubios Superiores have been selling at 8/3 @ 8/6 spot and 8/6 @ 8/9 futures; inferior quality on the spot at 7/10 @ 8/3. Campanil is at present bringing 10/ @ 10/3 on the spot and 11/3 futures. The week's export sums up 77,911 tons; since January 1 it has been 3,468,493 tons, against 3,264,963 in 1888 and 3,857,087 in 1887. *Pig-Iron.*—The export has been 789 tons for the week; coastwise shipments, 1248.—*Bilbao Maritimo y Comercial.*

BELGIUM.

BRUSSELS, November 30, 1889.—*Iron.*—The feverish condition of the Belgian Iron and Steel markets has experienced no abatement. Six weeks ago Merchant Iron was selling at 15 francs ₱ 100 kg.; it is now worth 18 francs. Sheets have advanced to 20 francs, and will probably be raised to 22 next week. Beams are 17.50, and will soon be 18. Germany being short of Pig-Iron is now buying in this country at 7.50, Forge, a state of affairs so unusual and abnormal that the entire movement begins to cause uneasiness among conservative people. Steel rails brought 155 francs.—*Moniteur des Intérêts Matériels.*

Engine Bearings.

Good fitting is answerable for by far the greater number of hot bearings, and the sea-going engineer who understands his business gets rid of hot bearings by flying in the face of principles and doing that which in the eyes of the builder is little short of ruining the brasses. Whether a bearing will or will not run cool is entirely a question of lubrication. The mere pouring of oil into a bearing does not constitute effective lubrication. It is essential that the oil shall get between the metallic surfaces and prevent actual contact. The lubricant plays the part of a multitude of tiny rollers or balls, and if it cannot get well between the journal and the brass it cannot act to advantage. When a bearing is got up to be a dead fit on the shaft efficient lubrication becomes next to impossible. A case in point suggests itself, says the *Engineer*. A marine engine was built with great care as to finish, to a rigid specification, and it was expressly stipulated that all the brasses should be scraped to a dead fit. Days were spent on them and the splendid fit stipulated for was got and the engines ran frightfully hot. Trial-trip after trial-trip was a failure from this cause. The engineer in charge was at last allowed to have his own way. The brasses were all taken out. When they were replaced they were certainly not dead fits, but the engines ran quite cool and gave no more trouble. A file is a far better tool with which to get up a brass than a scraper. Crank-brasses will run hundreds of miles before the file-marks disappear, simply because there is little or no friction. Every scratch of the file is a capillary-duct to take oil between the surfaces. The principle involved is very simple. Every precaution should be used to facilitate the getting of oil where it is wanted. If success is attained in this respect there will be no trouble.

Besides too good fitting, there is another defect which almost always goes with it. That is making the brass fit the shaft all the way round. This should never, under any circumstances, be done; channels should be cut in the brass the whole length of the bearing; at the sides with a vertical engine, at the top and bottom with a horizontal engine. Each of these channels plays the part of an oil-well or reservoir. In locomotive work big end brasses are often filed out oval above and below, of course to a small extent, so as to reduce the surface of true contact. The crank-pin is then certain to be wetted with oil; the oil cannot be squeezed out of the eased places. It will cling to them by capillary attraction, and no pressure is brought to bear to squeeze it out, consequently there is no heating. Railway axles seldom if ever give trouble by heating in the present day; that is because the bearing is taken on a comparatively narrow strip of metal the length of the journal. If dead-fit brasses grasping the journal all round its circumference were used the result would be disastrous.

As a rule the metal in a brass at the side of a journal is metal in the wrong place. In order to save cost and space the brass is usually made very thin at the sides; the maker reasons, very rightly, that it has next to nothing to do. When the stress comes on, and particularly if the journal heats at all, the brass bends in and the sides grip the shaft. We need not explain to engineers what follows. Probably it would require some courage on the part of a constructing-engineer to remove about one-third of the circumference of the inside of his brasses. Yet by doing so he would probably save others an infinity of trouble. Any one who is in a position to try the experiment will find for himself how great the advantage is. Sea-going engineers as a rule understand more about bearings than any other men living, and makers would do well to learn something from them.

As we have said, the whole secret of running a shaft cool lies in providing for its efficient lubrication, always provided, of course, that the surface is not so small that crushing of the metal takes place. Free channeling of the brasses and an absence of side pressure are demanded, and when these conditions are present the bearings ought to run cool. Care must be further taken, however, that there are no cross twists. One end of a long bearing will be sometimes seen to heat obstinately while the other end works cool. It will usually be found in such cases that the shaft is out of line, the brass sprung or the plummer-block tilted. There is one point on which we wish to warn our readers. Nothing will make an oval journal run without giving trouble, and there are far more oval journals in existence than is usually believed. The difficulty is to find a crank-pin that has not worn after a few years' use.

Haughey, McLerie & Co., Iron and Steel brokers, have discontinued their branch office at 115 Dearborn street, Chicago. The business of the firm will hereafter be conducted exclusively from 95 Fifth avenue, Pittsburgh.

Natural gas is reported to have been discovered in Martin County, Minn., by men engaged in digging an ordinary well. It was found at a depth of 75 feet and burst forth under strong pressure. Much excitement has been caused in the vicinity and other wells are being sunk to tap the supply.

MARKETS BY TELEGRAPH.

WEDNESDAY AFTERNOON.

Cleveland.

The activity in the Ore market is increasing, and very large quantities are being sold. Orders are being received from Eastern furnace men who have hitherto purchased foreign Ores exclusively. Geogebic and Menominee Bessemers are bringing $5.50 @ $6, f.o.b. vessels lower lake ports. The mining companies are already making arrangements to produce 9,000,000 tons of Ore next season, and the working capacity of every important mine will be increased. Little, if anything, has yet been done by the Champion and Republic companies for next season, although the furnace men interested in the first named mine have bought liberally of Bessemer Hematites at $6, f.o.b. vessels Cleveland. Sales of Pence and Hennepin Ore at $6.25 and of Dunn at $4.50 have occurred.

Pittsburgh.

While the market for raw material is not so much excited, the feeling is strong and still higher prices are looked for. As yet prices for finished material have not advanced nearly enough to cover the increased cost of raw material, and there is a good deal of complaint in consequence, but this in time will rectify itself.

Philadelphia.

The market has assumed a strong tone to-day. Pig-Iron is irregular, but there is a heavy demand and it is hard to place orders at satisfactory prices. Finished Iron is also held at full quoted rates and many orders declined because mills cannot make the deliveries as required. The feeling is decidedly strong all through the list.

Chicago.

Inquiries are increasing for Foundry Pig for next year's delivery, and prices are advancing. One leading seller in this market asks from 50¢ to $1 more than three days since. Several round lots of Bessemer have been sold at recent prices for next year's delivery, and makers now quote $23, but only for immediate acceptance. It looks as though $23 would soon be reached by Lake Superior Charcoal. Bar-Iron is quoted at price, but heavy buyers are beginning to test the market on Sheet-Iron. Old Iron Rails are still selling at $26.50. Old Car-Wheels are stiffening up, and sales have been made at $20. Nails are very firm; Cut Steel Nails are offered by some makers at present prices for January, with 5¢ advance for February.

St. Louis.

There is nothing of interest to report. Pig-Iron maintains the firm position noted in former reports. There is considerable inquiry for Bar-Iron, and jobbers report a firm market. Manufacturers of Barb-Wire say the demand this month promises to excel that of any corresponding month for years. They appear undecided, however, as to accepting orders for future delivery, and seem desirous of waiting until the first of the year to see further. Prices are liable to be advanced at any moment.

Hardware.

The demand for goods is only moderate, but a fair business is doing in view of the advanced stage of the season. The regular trade is stimulated somewhat by the condition of the market, which is still characterized by a decidedly firm tone and has on the whole an upward tendency. Heavy goods remain as they have been, but there are indications of an improvement in general Shelf Hardware, in which material does not figure so largely as an element of the cost. Some lines are as yet unaffected, and as low prices prevail as at any time during the past season, but most goods are firmer, if not actually higher. A hopeful feeling prevails in regard to the course of the market and the prospects for business, and it is anticipated that the coming season will be a very satisfactory one. In connection with the closing of the books at the end of the present year, it will be a satisfaction to Hardware men which they have not recently enjoyed to inventory many goods at higher prices than they paid for them.

Wire Nails.

There has been no marked change in the condition of the market and prices remain substantially as at our last review. There has been no further advance in price, but, on the other hand, there are indications that in exceptional cases slight concessions may be obtained on important orders from the market price of $3 per keg in carload lots at factory.

Cut Nails.

Aside from the placing of a number of California orders, on which competition was quite sharp and close prices were made, the New York Cut Nail market is firm at $2.10 for Iron Nails, with Steel Nails nominally $2.20 to $2.25.

Miscellaneous Prices.

General Shelf Hardware is giving some indications of increased firmness and some advances have taken place. Most of the manufacturers of Cast-Iron Goods have been withdrawing their extreme quotations and are apparently preparing for the issuing of discount-sheets. Revised prices have already been issued by the Peck, Stow & Wilcox Company in which a general advance is to be noted.

Both Cast and Wrought Butts continue very firm at the prices which have been prevailing, and the market is generally higher on these goods, as the leading jobbing houses are more generally asking advanced prices and are not showing as much of a disposition as heretofore to undersell the manufacturers. This is noticeable in the prices of the leading Philadelphia, Chicago and St. Louis houses.

The condition of the Copper market is affecting the prices of goods in which this metal enters largely as a material. The manufacturers of Brass Cocks, Fittings, &c., are withdrawing their extreme quotations and conferring with reference to the feasibility of a concerted advance. Other lines are similarly affected.

Enameled Hollow-Ware is regarded as very firm, and it is thought not unlikely that an advance will be announced early in the year. The prices of this line are in a satisfactory condition and not characterized by the irregularity that has sometimes prevailed.

The condition of the Iron market has not resulted in a general change in the prices of Horse-Nails, and the leading manufacturers are still selling at prices which have ruled for some time. There has, however, been an advance in the prices of some of the lower-priced goods which have been offering at very close net figures or at equivalent discounts. It is probable that unless the tone of the raw material undergoes important change there will be a gradual strengthening until prices are quite generally advanced.

A meeting of the Pick and Mattock manufacturers was held in Pittsburgh last week, the meeting being fairly attended. It is understood that most of the manufacturers, with one prominent exception, were represented, and an agreement was reached in regard to prices by which discount 60 and 5 per cent. was decided upon as the new quotation.

A meeting of the Common Carriage Bolt Manufacturers' Association was held in the Hotel Anderson, Pittsburgh, on Tuesday and Wednesday of last week. The attendance was large, and reports showed the trade to be in good condition. After a full interchange of opinions it was decided to advance the price, making the discount 70 and 12½ and 2 per cent. for cash, instead of 70 and 10 and 10 and 2 per cent., as heretofore. The advance went into effect on the 5th inst. The market in these goods is regarded as strong and prices are regularly maintained. The announcement of the advance by the manufacturers indicates their confidence that the present price of Iron is likely to be maintained.

Copper.

Revised price-lists of Sheet and Bolt Copper, Copper Bottoms, Pits and Flats are issued by the manufacturers, representing the advanced prices adopted the 5th inst. The following is the form in which the announcement is made by the New Haven Copper Company, 294 Pearl street, New York. Terms cash, without discount:

Sheet-Copper.		Per square foot. 64 oz. and over.	32 oz. and up to 64 oz.	16 oz. and up to 32 oz.	14 oz. and up to 16 oz.	12 oz. and up to 14 oz.	10 oz. and up to 12 oz.	8 oz. and up to 10 oz.	Lighter than 8 oz.
		Cents per lb.	Cents per lb.	Cents per lb.	Cents per lb.	Cents per lb.	Cents per lb.	Cents per lb.	Cents per lb.
Not wider than 30 in.	not longer than 72 in.	22	22	22	23	24	25	28	30
	longer than 72 in.	22	22	22	23	25	27	31	
Wider than 30 in. but not wider than 36 in.	not longer than 96 in.	22	22	22	24	26	30	33	
	longer than 96 in.	22	22	23	25	27	31	35	
Wider than 36 in. but not wider than 48 in.	not longer than 96 in.	22	22	24	26	29	32		
	longer than 96 in.	22	22	25	27	34	33		
Wider than 48 in. but not wider than 60 in.	not longer than 96 in.	22	22	27	29				
	longer than 96 in.	22	23	28	31				
Wider than 60 in. but not wider than 84 in.	not longer than 96 in.	23	24	29	33				
	longer than 96 in.	24	25	30	35				
Wider than 84 in.....		25	27						

Bolt Copper, ⅜ inch diameter and over, per pound, 22 cents.

Circles, 60 inches diameter and less, 3 cents per pound advance over lowest prices of Sheet-Copper of the same thickness.

Circles over 60 inches diameter up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet-Copper of the same thickness.

Circles over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet-Copper of same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over prices of sheet required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

TINNING.

Tinning sheets on one side, 10, 12 and 14 x 48, each..... 8¢
Tinning sheets on one side, 30 x 60, each... 30¢
For tinning boiler sizes, 9 inches, 14 x 60, each..... 15¢
For tinning boiler sizes, 8 inches, 14 x 56, each..... 12¢
For tinning boiler sizes, 7 inches, 14 x 52, each..... 12¢
Tinning sheets on one side, other sizes, per square foot..... 2½¢
For tinning both sides, double the above prices.

The following are the revised prices of Copper Bottoms, Pits and Flats, terms net cash:

14 oz. and over to square foot.....26 cents.
12 " " up to 14 oz. square foot.....27 "
10 " " " " 12 " " " .....29 "

All circles under eight (8) inches in diameter, 2 cents per pound more than foregoing prices, and no circles over 13 inches in diameter shall be classed as Flats.

Items.

The Grand Rapids Refrigerator Company, of Grand Rapids, Mich., manufacturers of the Leonard Cleanable Refrigerators, are issuing picture-cards lithographed in colors calling attention to special points in connection with their Refrigerators and also to the merits of the Leonard Patent Portable Storm-Houses, which they have recently brought out. A separate circular treats of the advantages of the method adopted by the company in putting charcoal filling in their Refrigerators.

Our Chicago office was favored during the past week with a call from Thompson McCosh, of the McCosh Iron and Steel Company, Burlington, Iowa. Mr. McCosh states that his company have enjoyed a remarkably good trade this year. The demand has exceeded their facilities for production, and consequently their capacity is to be increased as soon as the necessary buildings can be provided. It is proposed by the company to double their production of Wire and Wire Nails. The Bolt and

Nut department will also be greatly enlarged. The prosperity enjoyed by this company is certainly very gratifying.

J. H. Patterson, of the Wells & Nellegar Company, 72–76 Lake street, Chicago, has just returned home from a month's trip to the Pacific Coast. He visited the leading commercial points in that section, from Southern California to the new State of Washington, and reports the Hardware interests of the entire district in a most flourishing condition. The new cities in Washington are particularly worthy of notice in this regard, their rapid growth causing a very heavy demand for Hardware, with resulting prosperity for merchants. The increase in business has surpassed the accommodations of the leading firms, and new stores of much greater capacity are being built to meet their wants.

The Hodge & Homer Company have been incorporated at Chicago, with a capital of $50,000, to carry on a general Hardware business, succeeding the well-known firm of the same name at 47 West Randolph street. The incorporators are S. M. Hodge, B. F. Homer and Jesse B. Alton.

E. C. Stearns & Co., Syracuse, N. Y., manufacturers of Hardware, have incorporated under the same name, with a paid-in capital of $300,000. The officers are E. C. Stearns, president; A. S. Van Wagenen, vice-president; H. E. Maslin, secretary; E. P. Hasbrouck, treasurer.

The trade will observe the advertisement on page 68 in which the St. Louis Dripping Pan Company, St. Louis, Mo., call attention to the line of Dripping-Pans which they are putting on the market. Thirty-two sizes are made, ranging from 6 x 9 to 18 x 19.

Under date November 29 the Brunswick Hardware Company, Brunswick, Ga., announce that at a meeting of the charter members of the company, held November 28, the organization was completed by the election of a board of directors, consisting of C. B. Parker, Longview; J. J. Taylor, Cochran; T. C. Kittrell, Graham; W. B. Reeves, Macon, and E. M. Sargent, Valdosta, Ga. The directors subsequently chose T. C. Kittrell president, W. B. Reeves secretary and treasurer and E. M. Sargent purchasing agent and superintendent. Mr. Sargent was for several years connected with Weed & Cornwell, of Savannah, and with their successors, J. D. Weed & Co., and is therefore well qualified to discharge the duties of his position. The capital of the company is $50,000. They intend to conduct a wholesale business in general Hardware for the South Georgia and Florida trade. Mr. Sargent during December will be at the New York office, 102 Reade street, where all communications should be addressed.

The Wills Horse-Nail, manufactured in Chicago, is now being put on the market by B. L. Keen, room 545, Rookery Building, Chicago, special agent for the Wills Horse Nail Company. The sizes which the company are prepared to furnish are Nos 6, 7 and 8 with regular heads, 7 and 8 with Goodenough heads and 7 and 8 with heavy heads for reshoeing. The machine used in the manufacture of these Nails is of wholly original design, the patents being owned by the company, who claim that they have made a a new departure in the manufacture of Horse-Nails. They use the softest quality of open-hearth steel made in the United States. The machinery is so devised that there is absolutely no work on any part of the nail-plate after it is annealed except the point of the Nail, which is cold-hammered. Thus the body of the Nail is left free from the internal strains and brittleness which result from the manipulation of the steel cold. Several tons of these Nails have already been marketed, and the company claim that they have been successful in entirely overcoming the prejudice which has always existed against the machine-cut steel Nail. It is asserted that the point being cold-hammered and sharpened, this Nail will drive into the hardest hoof, owing to the keenness of the point, at the same time making an unusually strong and stiff clinch.

Empire Portable Forge Company, Lansingburg, N. Y., have brought suit, we are advised, against the Palmer Hardware Mfg. Company for the infringement of the old Vetterlein patent, which they own and which covers, we understand, a Sash-Pulley made with rounded sides adapted to fit into a socket produced by a series of connectedly-bored auger-holes. This patent is referred to as covering many of the Sash-Pulleys now made, and it is claimed by the Empire Portable Forge Company to cover the Pulleys made by the defendants.

A manufacturer of Edge-Tools, with whom Adzes are a prominent line, calls attention to the fact that these goods are still in the freight classification third class, when they should be in justice fourth class, as are Axes. It is obvious that the classification matter is not yet adjusted so as to meet the reasonable demands of interested manufacturers, and the advisability of agitating the matter is manifest.

James B. Hoyt, Troy, N. Y., issues a circular describing Hoyt's Calking-Boot. These Boots are made of sheet-steel with rubber roll on top. They fasten with a brass clasp, and the use of straps and buckles is dispensed with. They are referred to as easily and quickly affixed and as being light, so that the horse scarcely knows he is wearing them.

The trade will observe on page 70 the advertisement of John H. Graham & Co., 113 Chambers street, New York. It is devoted, it will be observed, to Gibbs' Lawn Rake, Canton Lawn Rake and Gibbs' Post-Hole Diggers, with cuts showing the construction of these articles and illustrations showing the manner of their use.

The Francis Axe Company's building in Buffalo was partly destroyed the 6th inst. by a fire which broke out in Chas. H. Carter's machine-shop. The trade will be glad to learn that this fire will not interfere with the filling of orders for Axes, as the company have a full stock on hand, so that all orders can be promptly attended to.

Henry A. Uehren, Galena, Ill., has disposed of his Hardware business to A. G. and Geo. T. Millhouse, who will carry it on under the firm name of Millhouse Bros. Mr. A. G. Millhouse has been employed by Mr. Uehren for a number of years and is referred to as understanding the business thoroughly. His brother is at present in the accountants' department of Marshall Field's establishment, in Chicago. They are referred to as energetic and reliable young men, deserving of success. The business was bought from R. Geselbracht in 1877 by H. A. Uehren and James Oates, and for nine years the firm name was Oates & Uehren. In 1886 Mr. Uehren bought his partner out and has since conducted the business alone. Having disposed of his business in Galena, Mr. Uehren will remove to Aurora, becoming a partner of A. G. Case, a prominent Hardware merchant of that city. He will remain in Galena until January 1, closing up his business. The manner in which Mr. Uehren is referred to by the press of Galena indicates the regard in which he is held and the prominent position he has occupied in business circles, having been president of the Business Men's Association since its organization.

F. E. Myers & Bro., Ashland, Ohio, issue a circular in regard to their Metal-Rail Track and another in regard to their Pumps. In the former of these circulars 40 reasons are given why they have sold over 1,250,000 feet of this Track, and in the latter 60 reasons why persons buy Myers' Pumps.

J. A. & E. P. Cooper, Struthers, Ohio, issue a small circular describing the Simmons Drop-Perch Gear-Irons, giving illustrations and price-list.

Fulton Iron and Engine Works, Detroit, Mich., have issued a new circular relating to their Sure-Grip Steel Tackle-Block, of which they give a full description, pointing out the advantages possessed by it, with a number of testimonials from parties who have used it. These Blocks have met with a very satisfactory sale and are meeting with a large demand.

McIntosh, Huntington & Co., Cleveland, Ohio, have issued thir winter circular of seasonable goods and specialties. Skates, Children's Sleighs, Sleigh-Bells and Toy Banks are the principal lines illustrated, Butcher-Knives, Fruit-Knives, Nut-Picks and Silver-Plated Ware also receiving attention.

Our readers will observe the notice on page 51 in which it is announced that the firm of Gilbert, Sweet & Lyon, 33 Chambers street and 9 Reade street, New York, will dissolve by limitation December 31. Their well-assorted stock of Hardware, Tools, &c., is offered for sale at special prices, an opportunity which will doubtless be appreciated by the trade. The many friends of this well-known and long-established house will regret to learn that they are intending to go out of the jobbing business, and will hope that in one form or another they will continue their connection with the trade.

Van Wagoner & Williams Company, 82 Beekman street, New York, have purchased from the Henry C. Hart Mfg. Company, Detroit, Mich., their Spring-Hinge and Door-Spring business, consisting of the Royal, Champion, Rumney, Reliable and Standard Spring-Hinges and the Standard Coil Door-Springs, and they announce that they will manufacture the goods either in Detroit or at some other point in the West and make shipments from factory and from their New York office. A joint circular relating to this transaction is issued by Van Wagoner & Williams Company and Henry C. Hart Mfg. Company.

The Iowa Traveling Salesmen's Association held their ninth annual meeting at Des Moines on the 6th and 7th insts., participating in a banquet at the Savery House on the evening of the first day. One hundred and fifty were present, representing every leading branch of trade.

The Jos. Dixon Crucible Company, Jersey City, N. J., have lately added a long-distance telephone to their office equipment. This enables them to take quick orders from those who are convenient to such telephones or who are similarly equipped.

Our readers will observe the announcement on page 74 in which Robert B. Hugunin, Hartford, Conn., announces the offer for sale of the Canadian patent for a small article in Builders Hardware, alluding to the advantages which it possesses for manufacture.

R. W. Edwards and G. Frederick Collins, 258 Bullitt Building, Philadelphia, are arranging for a trip through Peru, Bolivia, Chili, Argentine Republic and Uruguay. Mr. Edwards, we are advised, has been interested in the export trade for some years and Mr. Collins has been identified with the Iron, Steel and Hardware

trades. They desire to represent American manufacturers to the export buyers in the countries named.

Obituary.

In the death of Geo. W. Albertus the Hardware trade of New York has lost one who was one of its older members and was prominently identified with its interests a generation ago. He was for many years connected with the house of Wolfe, Nash & Fisher, and was subsequently an importer of Cutlery and English goods. His health kept him out of business for the past few years.

The following sketch which has been furnished us, giving the outlines of the business career of William R. Lane, Haverstraw, N. Y., will be of interest to his many friends:

William R. Lane, who for about a half-century has been engaged in the Hardware business in Haverstraw, N. Y., died at his residence in that village December 3, aged 73 years. Mr. Lane was born at Yorktown, N. Y., September 15, 1816. He was given by his parents a liberal common-school education, and at the early age of 13 years left home to learn the hatter's trade; but having no taste for that business, three years after he went to New York City to learn the trade of a brass turner and filer with Day & Co., where he served his apprenticeship. About 50 years ago Mr. Lane associated himself with one of that firm and came to Haverstraw, where for a time they engaged in the locksmith business. Afterward Mr. Lane accepted a position in the rolling-mill at West Haverstraw, which at that time was doing an active business. In the year 1842 he launched out for himself and established the Hardware business at the well-known stand in Main street, where he continued until his death. January 1, 1879, he formed a copartnership with his son, Mr. Charles R. Lane, who relieved him of much of the care and responsibility connected with the conduct and extension of the business. Mr. Lane was well known in business circles, both in Haverstraw and New York City, as an upright and honest man, always dealing fairly with his fellow-men. Although past three-score and ten, he was remarkably active for one of his years, and was always found at his place of business until smitten down by disease a few weeks ago. His personal and business qualities endeared him to a host of friends, while as a merchant he has been eminently successful in all his undertakings, and with the aid of his son has built up a large and lucrative trade. The business will be continued at the same place as heretofore by the surviving partner, Chas. R. Lane.

Buyer's Record.

At our request Fred P. Straub & Co., Evansville, Ind., have sent us a description of their method of marking prices, recording their purchases and other matters connected with the routine of their extensive and admirably conducted business. Some of these we shall have occasion to refer to in a later issue. But we give below a description of the book which is used by the buyer for recording in some detail the purchase of goods. This book was specially prepared for this purpose, and has been in use since 1869. The pages are about 12 x 7½ inches and are ruled, headed and used as shown herewith in the partial reproduction of one of them. Each book contains about 500 pages.

It will be observed that the form gives a very complete record, which has been found exceedingly convenient for reference, showing as it does what is ordered, date of order, from whom, when the bill is paid, when receipted and how long the goods have been on the way, thus giving dates which are of service in estimating when goods recently ordered may be expected to arrive. As it is the uniform custom of this house to pay cash within ten days from date of shipment for all their goods, they keep no account in their general ledger with firms of whom they purchase, and therefore this book was specially prepared that a proper record might be kept of all such transactions.

FRED. P. STRAUB & CO.

Articles.	Ordered from.	Manuf'r or dealer.	Number and name of street.	City	When ordered.	Date of bill.	Amt.	Date of arrival.	When paid.	When receipted	Remarks.
Shovels.	*Hubbard & Co.*	*Manuf'r.*	*No. 10 Smith.*	*Pittsburgh.*	*Jan. 1, '89*	*Jan. 10, '89*	*100.00*	*Jan. 18, '89*	*Jan. 18, '89*	*Jan. 22, '89*	*By river.*

Buyer's Record.—Fred. P. Straub & Co., Evansville, Ind.—Size of Page, 12 Inches Wide, 7⅞ Inches Deep.

The Farmers' Alliance.

BY KNARF.

The Farmers' Alliance is becoming a recognized factor in Western politics, but in this aspect we do not wish to speak of it. To show its aims and relations to the Hardware trade will be the object of this article, and can best be brought out by giving a conversation in a way car of a freight train on a Western road between a farmer who is a member of the alliance and a Hardware salesman.

The conversation started by comparing the low price of farm products and the advancing price of Hardware.

Farmer: The trouble with us farmers is we can't get near to the jobber to buy our Nails and Barb-Wire. I know that Bolton, our retail Hardware man, has to make 20 to 30 per cent. on his goods to make a living and run his business, and that's just what we don't want to pay. We can't make prices for our produce, cattle or hogs, but have to take just what the buyers want to pay. We are being robbed all the time and at both ends.

Salesman: There are two other Hardware stores in the town where you trade. If you think Mr. Bolton charges you too much for your goods, why don't you buy of one of the others?

F.: No. Bolton is a square man and I like to deal with him; think he sells as cheap as he can and make a profit. But why couldn't we buy goods of your house—say a carload of Barb-Wire or Nails? We could divide it up between four or five of us neighbors and save lots of money.

S.: If we should sell to you farmers Bolton would not buy any more goods of us, as it would interfere with his trade, and I would not blame him one bit for taking his trade away from us. Then another thing, you nor your Farmers' Alliance has no financial standing, and unless we can get a satisfactory report from Dun or Bradstreet we won't sell a man.

F.: But we would pay the cash and you could have the goods shipped to the next station. There is no Hardware there and Bolton would never know the difference. I don't see why some wholesale house does not do this kind of business; they could make lots of money.

S.: In the first place, if you and your neighbors can raise enough cash to buy a carload of Wire you are better fixed than most farmers I know. Now, honestly, is there enough of that kind of business to justify a firm to give up their established trade with the merchants and depend on that alone? Of course the merchants would not buy of us if we sold to the alliance.

F.: No, there isn't enough now, but it would grow.

S.: Then there are some things you would have to buy of Bolton. When you wanted 2 or 3 pounds of Nails or a Tin Bucket, or have a little soldering done, you would go to him?

F.: Yes, we would buy some things of him that we could not do without.

S.: That is it; you want to make a convenience of him, buy what you could not get of us. He would soon starve and then fail.

F.: Well, these merchants are just getting rich off us. Why, I can send to the grange-house in Chicago and buy a single keg of Nails cheaper than I can buy them of Bolton, and he gets them by the carload.

S.: That I doubt, for I know Bolton is selling Nails retail by the pound for less than he can lay them down for now since the last advance. These merchants you are trying to ruin are your best friends. You buy goods of Bolton, say 1000 pounds of Barb-Wire in the spring. After it is loaded on your wagon and you gather up the lines to drive away you tell him him you "will pay for it after harvest." You let the matter run until he speaks about it and says he must have the money. You are surprised, wonder if he wants you to sell your oats for 13 cents a bushel or corn at 16 cents or 17 cents to pay him for that Wire. Why, you tell him you have been trading with him for years and he shouldn't be hard on you. If he should go out of the Hardware business what would he do?

F.: Oh, he could railroad. He used to be a railroad man.

S.: But he don't want to be away from home. He has put his money into the business, put in his time and run the risk of failure all for the privilege of accommodating you farmers. If you can buy so cheap of the grange store in Chicago what more do you want?

F.: Well, they claim to sell as cheap as any wholesale store, but I don't believe they do.

S.: Of course they can't sell goods in retail quantities as cheaply as in wholesale lots. We could not either if we did

business with you. It requires more help and more labor all around. No, my friend, you are on the wrong track. You better be satisfied with the way things are now. I have talked pretty plain to you, but you need such talk to make you see things in the right light. But I get off here.

F.: We will keep trying until we get there, though.

An Ideal Hardware Clerk.

In a recent issue of *Wide Awake* appeared an interesting story of a clerk who worked his way up from the position of apprentice in a hardware store to a partnership in the concern. The story is a good one, and we present it herewith for the perusal of ambitious clerks who are members of the fraternity:

"It was the best boy's story I ever heard," was what a lawyer said of the one I am about to relate to you.

"We have had a good many boys with us from time to time," said Mr. Alden, the senior member of a large hardware establishment on Market street, Philadelphia, "as apprentices to learn the business. What may surprise you is that we never take country boys unless they live in the city with some relative who takes care of them and keeps them home at night; for when a country boy comes to the city to live everything is new to him, and he is attracted to every show-window and unusual sight. The city boy who is accustomed to these things cares little for them, and if he has a good mother he is at home and in bed in due season. And we are very particular about our boys, and before accepting one as an apprentice we must know that he comes of honest and industrious parents.

"But the best boy we ever had is now with us and a member of the firm. He is the one man in the establishment that we couldn't do without. He was 13 years old when he was apprenticed to us and he was with us for 11 years, acting for several years as salesman. When he first came we told him that for a long time his wages would be very small, but that if he proved to be a good boy his salary would be increased at a certain rate every year, and as it turned out when, according to agreement, we should have been paying him $500 a year we paid him $900, and he never said a word himself about an increase of salary. From the very outset he showed that he had an interest in the business. He was prompt in the morning, and if kept a little over time at night it never seemed to make any difference with him. He gradually came to know where everything was to be found, and if any information was wanted it was to this boy, Frank Jones, that every one applied. The entire establishment seemed to be mapped out in his head and everything in it catalogued and numbered. His memory of faces was equally remarkable. He knew the name of every man who came to the store to buy goods, what he bought and where he came from. I used often to say to him: 'Jones, your memory is worth more than a gold mine! How do you manage to remember?'

"'I make it my business to remember,' he would say. 'I know that if I can remember a man and call him by name when he comes into the store, and can ask him how things are going on where he lives, I will be very likely to keep him as a customer.'

"And that was the exact case. He made friends of buyers. He took the same interest in their purchases as he took in the store, and would go to no end of trouble to suit them and to fulfill to the letter everything he promised.

"Well, affairs went on in this way until he had been with us for 11 years, when we concluded to take him in the firm as a partner. We knew that he had no extravagant habits, that he used neither tobacco nor beer nor went to the theater. He continued, as in the beginning, to board at home, and even when his salary was the very lowest he paid his mother $2 a week for his board. He was always neatly dressed, and we thought it was very probable that he had laid up $1000 or $2000, as his salary for the last two years had been $1200. So when we made him the offer to become a partner in the business, and suggested that it would be more satisfactory if he could put some money into the firm, he replied:

"'If $10,000 will be any object I can put in that much. I have saved out of my salary $9400, and my sister will let me have $600.'

"I can tell you that I was never more astonished in my life than when that fellow said he could put in $10,000, and the most of it his own money. He had never spent a dollar or 25 cents or 5 cents for an unnecessary thing, and had kept his money in bank, where it gathered a small interest. I am a great believer in the Bible, you know, and I always kept two placards in big letters in the store. On one was this text: 'He that is faithful in that which is least is faithful also in that which is much,' and on the other: 'He that is diligent in business shall stand before kings and not before mean men.' And Frank Jones' success was a literal fulfillment of these texts. He had been faithful in the smaller things as in the greater ones and diligent in business. That kind of a boy always succeeds," concluded Mr. Alden.

Exports.

PER BARK THOS. A. GODDARD, NOV. 27, 1889, FOR WELLINGTON, NEW ZEALAND.

By Edward Miller & Co.—9 packages Lamp Goods.

By Welch & Lea.—11 cases Iron Bolts.

By W. & B. Douglas.—6 Pumps.

By H. Disston & Sons.—13 cases Hardware.

By F. B. Wheeler & Co.—1 case Hardware, 6 dozen Springs, 2 dozen Hammers, 2 gross Pulleys, 2 cases Hardware, 1 bale Cordage, 1 case Hardware, 3 cases Castings, 7 cases Hardware.

By Arkell & Douglas.—1 case Drills, 1 case Hammers, 1 box Braces, 7 boxes Hardware, 1 package Saw-Blades, 1 case Hammers, 1 box Hatchets, 1 box Locks, 1 box Traps, 3 boxes Hardware, 5 boxes Picks, 3 packages Churns, 2 packages Hardware, 3 cases Axles, 23 packages Lamp-Ware.

By W. H. Crossman & Bro.—3 dozen Hatchets, 1 Rifle, 10,000 Cartridges, 6 cases Hardware, 1 dozen Hay-Knives, 1 bale Twine, 2425 pounds Horse-Nails, 4 packages Plow Parts, 6 dozen Egg-Beaters, 3 dozen Grindstone Fixtures, 24 dozen Handles, 7 dozen Blocks, 2 dozen Mallets, 6 dozen Hatchets, 19 sets Axles, 7 dozen Cow-Bells, 1 case Hat-Racks and Hardware.

By H. W. Peabody & Co.—30 packages Hardware, 12 dozen Traps, 2 dozen Wringers, 2 cases Agricultural Implements, 7 crates Stoves, 70 dozen Handles, 12 gross Pencils, 2 cases Bolts, 32 packages Carriage-Ware, 3 cases Handles, 8 cases Hardware, 68 cases Edge Tools, 7 packages Lamp-Ware, 10 cases Hardware, 1 case Agricultural Implements, 23 dozen Wringers, 31 dozen Handles, 3 dozen Traps, 2 cases Stamped-Ware, 1 case Corn-Mills, 3 cases Wood-Working Machinery, 5500 pounds Nails, 186 dozen Handles, 3 cases Ammunition, 11 packages Stoves, &c., 28 packages Hardware, 600 pounds Nails, 400 feet Belting, 1 case Plated-Ware, 1 case Agricultural Implements, 1680 pounds Nails, 1 cask Pumps, 40 cases Edge Tools, 1 case Agricultural Implements, 350 dozen Handles, 1 case Agricultural Implements, 1 dozen Wringers, 400 pounds Nails, 12 cases Hardware, 250 Handles, 2240 pounds Axle-Grease, 2 packages Hardware, 9 packages Windmills, 2 dozen Wringers, 2 dozen Faucets, 6 cases Edge Tools, 210 dozen Handles, 1 case Japanned-Ware, 145 pounds Bolts.

By McLean Bros. & Rigg.—1 case Castings, 12 dozen Handles, 19 Stoves, 30 dozen Axes, 1 gross Potato-Peelers, 3½ dozen Churns, ½ dozen Meat-Choppers, 4 cases Hardware, 4 dozen Wringers, 6 cases Horse-Nails, 1 dozen Cork-Pullers, 1 dozen Carpet-Sweepers, 1 case Nails, 450 pound Nails, 300 Pot and Kettle Scrapers, 2 dozen Hammers, 12 dozen Mattocks, 1¼ dozen Steel Sinks, 4 Agricultural Implements, 2 Guns, 5 cases Agate-Ware, 12 dozen Hammers, ¼ dozen Step-Ladders, 3 cases Hardware, 6 Scales, 5000 Cartridges, 2½ dozen Pumps, 7 cases Hardware, 3 cases Hardware, 1 dozen Churns, 30 Lawn-Mowers, 1200 Bolts, 5 dozen Handles, 3 dozen Gate-Latches, 1 case Hardware, 1 dozen Casters, 3 dozen Wrenches, ¼ dozen Churns, 1 dozen Picks, 1 dozen Mattocks, ½ dozen Hay-Knives, 3 dozen Handles, 2 Drills, 3 Velocipedes, 4 cases Granite Iron-Ware, 4 dozen Axes, 36 packages Stoves and Parts, 29 packages Carriage-Ware, 9 cases Castings, 6 dozen Wash-Boards, 1 gross Mop-Handles, 4 dozen Axes, 6 cases Tacks, 4 gross Whetstones, 200 Pot and Kettle Scrapers, 2 dozen Vises, 2 dozen Axes, ½ dozen Hay Knives, 13,440 pounds Axle-Grease, 4 cases Hardware, 3½ gross Glue, 22 packages Hardware, 9 dozen Nutmeg-Graters, 3 cases Hardware, 1 dozen Step-Ladders, 22 Churns, 5 dozen Plumbs and Levels, 20 dozen Saws, 1 Drill, 18 sets Axles, 4 Plows, 96 Handles, 10 Pumps, 4 dozen Mattocks, ¼ dozen Velocipedes, 48 dozen Oil Stoves, 2 cases Wire Goods, 6 dozen Hammers, 9 dozen Bird-Cages, 2 dozen Braces, 1 dozen Meat-Choppers, 6 dozen Axle-Grease.

By R. W. Forbes & Son.—19 packages Hardware, 174 dozen Axe-Handles, 900 pounds Horse-Nails, 2 dozen Hay-Knives, 1 case Sad-Irons, ½ dozen Mangles, 2 dozen Meat-Choppers, 3 Bicycles, 1½ dozen Wringers, 1 case Traps, 1 case Stamped-Ware, 2 dozen Axes, 1 dozen Hatchets, 6 dozen Axes, 22 packages Hardware, 6 racks Churns, 144 dozen Axe-Handles, 6 dozen Egg-Beaters, ½ gross Axle-Grease, 2 cases Scales, 3 dozen Pruning-Shears, 1 dozen Hay-Knives, 4 racks Churns, 3 dozen Shovel-Handles, 1 dozen Shotguns, 12 dozen Forks, 34 bundles Wash-Boards, 408 dozen Axe-Handles, 20 packages Hardware, 20 packages Wash-Boards, 9 racks Churns, 1½ dozen Wringers, 168 dozen Axe-Handles, 19 cases Finishing-Nails, 80 dozen Axe-Handles, 80 dozen Axes, 1762 pounds Manila Cordage, 98 cases Tools, 7776 pounds Horse-Nails, 1 case Machinery, 50 kegs Nails, 6 packages Hardware, 10 cases Hardware, 600 pounds Horse-Nails, 1 box Screw-Plates, 1 box Broilers, 1 case Meat-Choppers, 1 box Locks, 1 case Egg-Beaters, 2 dozen Forks, 1 case Agricultural Machinery, 1 case Curry-Combs, 1 case Hay-Knives, 3 cases Tacks, 2 cases Saws, 4 dozen Forks, 1 case Meat-Choppers, 3 packages Sad-Irons, 3 cases Mattocks, 17 packages Stoves, 1 case Mangles, 4 packages Lamp-Ware, 1 case Tire-Bolts, 4 packages Harrows, 3 boxes Picks, 1 barrel Blocks, 3 racks Churns, 38 dozen Axes, 6 dozen Shovel-Handles, 12 dozen Sledge-Handles, 408 dozen Axe-Handles, 16 dozen Hammers, 1½ dozen Wrenches, 2 cases Drills, 16 dozen Axes, 6 packages Lanterns, 3 cases Lamp-Ware, 1 case Traps, 9 dozen Rakes, 1 case Hat-Hooks, 3 dozen Hay-Knives, 5 cases Hardware, 1 case Lamp-Ware, 40 kegs Nails, 6 cases Hardware, 1 case Lamp-Ware, 6 gross Lamp-Wicks, 2 packages Kitchen-Ware, 4 dozen Hay-Knives, 20 dozen Spade-Handles, 7 packages Hardware, 10 cases Polish, 1 case Oil-Gates, 36 dozen Fork-Handles, 24 cases Oil-Stones, 336 dozen Axe-Handles, 15 dozen Wrenches, 1 cask Lamp-Ware, 515¼ pounds Cord, 1 case Egg-Beaters, 3 Stoves, 3022 pounds Axles, 1 case Hardware, 3 cases Carriage-Bolts, 1 case Braces, 17 packages Hardware, 1 case Braces, 1 barrel Blocks, 18 dozen Spade-Handles, 6 crates Stoves, 1 case Carriage-Bolts, 1 case Lamp-Ware, 1 case Emery-Wheels, 4 cases Hardware.

PER BARK WESTERN BELLE, DECEMBER 2, 1889, FOR DUNEDIN, NEW ZEALAND.

By W. K. Freeman.—805 pounds Hardware, 3472 pounds Axles, 381 pounds Scales, 1823 pounds Hardware, 49 pounds Drills, 806 pounds Scales.

By F. B. Wheeler & Co.—2 Wagons, 1 case Hardware, 1 case Wagons, 1 box Carriage-Ware, 5 dozen Hatchets.

By W. H. Crossman & Bro.—15 dozen Hay-Forks, 14 cases Plow Parts, 1 dozen Hammers, 2 dozen Parers, 22 packages Lamp Goods, 1 case Plated-Ware, ¼ dozen sets Sad-Irons.

By Samuel Lee & Co.—2 cases Wood-Working Machinery.

By Edward Miller & Co.—10 packages Lamp Goods.

By Dunbar, Hobart & Co.—6720 pounds Nails, 4480 pounds Nails.

By Chas. Brewer & Co.—12 cases Handles, 3 cases Tools, 1 case Horse-Nails, 3 cases Tools, 5 cases Handles, 3 cases Agricultural Implements, 9 cases Hardware, 65 packages Lamp-Ware, 5 cases Stamped-Ware, 10 kegs Axle-Grease, 23 cases Hardware, 6 cases Lanterns, 30 cases Tools, 18 cases Handles, 6 cases Horse-Nails, 1 cask Pumps, 1 case Flint Paper, 3 cases Scales, 1 cask Blocks, 2 cases Agricultural Implements, 32 crates Stoves and Parts, 7 cases Machines, 3 cases Bolts and Nuts, 2 cases Plated-Ware, 48 crates Stoves and 16 packages Stove Utensils, 13 cases Hardware, 57 cases Handles, 3

bundles Handles, 23 cases Tools, 4 cases Agricultural Implements, 16 cases Machines, 19 cases Horse-Nails, 1 case Plated-Ware, 9 packages Lamp Goods, 1 bale Rubber, 2 cases Trucks, 1 hogshead Pumps, 9 cases Scales, 13 cases Hardware.

FOR LYTTLETON.

By Edward Miller & Co.—25 packages Lamp-Ware.

By New York Crayon Company.—500 gross Chalk Crayons.

By Coombs, Crosby & Eddy.—13 dozen Hay-Rakes, 16 Blocks, 4 Churns, 5 dozen Hardware.

By Dunbar, Hobart & Co.—2240 pounds Nails.

By J. Dixon Crucible Company.—850 pounds Crucibles.

By Hoadley & Co.—30 Pumps, 1 box Hardware, 24 Churns.

By A. Field & Co.—40 dozen Axle Clips, 1000 Tubes

The Sheffield Market.

From *Ironmongery*, 30th ult., we take the following report of the condition of the Sheffield market:

There is no change of importance in the condition of trade in this district. The leading branches continue to be well employed, although the additional orders during the week are perhaps not so heavy as has been the case during recent weeks. The raw-material markets have been subject to some fluctuation, but on the whole the prices of the previous week have been fully maintained and in some important cases exceeded.

The United States of America have now entered the market as large purchasers of Swedish Steel Irons and in sympathy with that demand the prices have materially advanced. The Swedish houses have demanded and secured advances to a very considerable extent and express themselves indifferent as to the requirements of their customers here, the fact being that the additional American demand has taxed their resources to the uttermost. This condition of things will necessarily affect to some extent the prices ruling for the better grades of Steel, as for the moment the importers of Swedish Irons have withdrawn all quotations. There is talk, too, of further considerable advances in the prices for rolling, the proprietors of the mills evidently intending to benefit to the utmost extent from the prosperous conditions which now obtain.

In the File trade the greatest possible activity is reported and most houses have booked forward orders into the new year. The advance due on the 18th inst. has been with few exceptions conceded, and the makers generally have made corresponding reductions in their discounts, without apparently staying the rush of orders.

Saw manufacturers are well employed as a whole, although some few houses could without difficulty provide for a larger demand. Edge-Tools are in active demand for an all-round market.

Cutlery and Electro-Plated Goods cannot be produced by the leading houses fast enough to satisfy the demands of the home markets, and a gratifying run upon season's lines continues without abatement.

The Engineers' Tool manufacturers are well engaged both for home and foreign requirements, and the heavy trades report an ever-increasing demand.

Glass-blowing by machinery is being prosecuted successfully at Ellenville, New York. The machine consists of an iron upright, around which revolve arms fitted with molds for shaping the glass. A pipe supplied with a current of air and readily manipulated by the operator does the work of blowing. The machine is said to be capable of turning off 100 dozen of perfect bottles a day. It costs but about $200 and will take the place of two skilled men, who command from $5 to $7 a day each. The machine is an English invention and has been in use about a year.

December 9 marked the day of the heaviest output thus far attained by the Scranton Steel Company, of Scranton, Pa. During the day turn the Bessemer plant in 75 heats made 449 ingots weighing 519 tons 3 hundred-weight. During the night-time, in the same number of heats, 520 tons 11 hundred-weight were produced, a total in one day of 1039 tons 14 hundred-weight.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Paints and Colors.

With favorable weather for the pushing forward of building operations and a great deal of painting work that had to be deferred last month owing to rains, the distribution of Paints and Colors is now proceeding with some degree of spirit. Goods are taken only as imperative wants necessitate, but those wants are amounting to considerable in the aggregate and involve the movement of fairly liberal quantities of Leads, Zincs, Dryers and House-Painters' Colors at the present time, making a volume of business that compares most favorably with the average for the early part of December. In addition to the trade passing in this way there is more or less in the form of contracts for bulky goods for grinders' use. Prices are slightly irregular on some few lines of Colors, but otherwise steady.

White Lead.—Corroders report a very good trade during the week, chiefly through small orders from near-by buyers, whose requirements, to all appearances, have been greater than at any previous time the past six or eight weeks. So far as can be learned the selling prices have not varied. Corroders in the trust adhere to the old terms, and outside manufacturers do not appear to go below the official net prices. Jobbers, as a rule, still handle the pigment merely as a leader.

Zincs.—The movement of American Oxide in jobbing quantities has been very fair, showing some improvement over that of last week and reaching reasonably good proportions. Supplies remain in favorable position and prices very steady. Foreign Zincs are also selling to a fair extent in moderate-sized lots at steady prices.

Paris Green.—Members of the Paris Green Association have done nothing in the direction of improving the situation, and the feeling exhibited within and outside of the nominal combination is such that the outlook is considered unfavorable for any immediate change for the better. Members of the association assert that they have made no contracts at fixed prices, but outside manufacturers have taken orders for January and February delivery at 14¢ @ 15¢ for bulk and corresponding prices for packages.

Other Colors.—House-Painters' Colors have had rather better sale in a jobbing way and an improvement is noted in Grinders' Colors in some quarters. Prices have varied to no unusual extent in any line of goods, and the general market may fairly be said to preserve a steady tone.

Miscellaneous.—Whiting has been selling to a fair extent at steady prices and the movement of Paris White keeps up well also. Barytes continues very scarce and firm for both prompt and future delivery.

Animal and Vegetable Oils.

Very few and only unimportant changes have taken place in this branch of trade, and the general situation at the present time differs but little from the position a week ago. Cotton-Seed and Lard products, being influenced by special circumstances, fluctuate to some extent, yet within narrow bounds; but all other Oils seem to have the support of favorably situated supplies and of firm position and prices of crude materials. Buyers' operations are within conservative lines, as customary toward the close of the year, but the volume of business makes a seasonably good showing and the general demand is all that could be fairly looked for. In some branches, more particularly in Fish Oils, the tendency seems to be in the direction of rather higher prices, and there is a growing impression that Cotton-Seed-Oils will do better later on, although freely offered at the present time.

Linseed-Oil.—City crushers have made no changes in their prices for either Calcutta or domestic seed product. The movement has been rather freer this week than last and the market remains very firm.

Cotton-Seed-Oils.—Sales of crude Oil amount to at least 2000 barrels, all for home account and chiefly at 28¢, showing a steady market and good movement from first hands. The refined Oils are steady, except perhaps where export business may be involved. Shippers claim to have purchased Summer Yellow at 33¢, or 1¢ below the minimum price generally quoted.

Lard-Oil.—Prices have been rather firmer under the influence of slightly-increased cost of raw material and somewhat better demand. Some outside brands of prime quality might be secured at 53¢, but city pressers name 54¢ as their inside figures.

Sperm-Oil.—There has been no business in crude at above 65¢ in New Bedford, but that price has been refused within a few days and holders stand out for 67¢. The manufactured Oils are very firm and selling to a fair extent.

Whale-Oils.—There is not the slightest change in the position of crude Oil, and the manufactured products, while quiet, are very firmly held.

Menhaden-Oils.—Exporters have taken fair quantities of crude at firm prices, say on the basis of 23¢ for prime. The home distribution of Pressed and Bleached Menhaden and Tanners' Oils is good, at firm prices.

Olive-Oils.—Italian in barrels has been selling at 73¢ for ordinary quality to a very fair extent and the market remains firm.

Cocoanut-Oils.—Arrivals have been quite heavy, but the greater portion was sold previously and prices show only slight change. Ceylon sold at 5½¢, ex-ship.

The Brooklyn Bridge is in a flourishing condition. During the year ending December 1 it carried 33,953,773 railroad passengers and 3,195,687 foot passengers; total, 37,150,460. The total receipts were $1,120,024, but owing to purchases of real estate and extensions there is a deficiency of about $150,000, which is covered by the balance in hand from the previous year. Two vessels lost their topmasts while passing beneath the bridge.

Never in the history of St. Louis have the receipts of corn been so large as during the present season. The aggregate comprises 25,000,000 bushels, or 10,000,000 bushels in excess of the receipts of last year to a corresponding date. Wheat receipts are nearly 12,000,000 bushels, or about the same as for the same time in 1888. More elevators are wanted for storage purposes.

William Sellers & Co., Incorporated, have contracted to build a set of vertical bending-rolls to bend steel plates 120 inches wide by 1½ inches thick to either a cylinder or conical form and avoid calendering in the operation.

John M. Lachlan, of the Franklin Works, in Brooklyn, has patented an improved marine boiler in which circulating-pipes are employed in the fire-box and in the water-space at the bottom of the boiler below the ash-pit.

Never-Break Wrought-Steel Hollow-Ware.

The Bronson Supply Company, Cleveland, Ohio, for whom Hall & Near are agents, 51 Cliff street, New York, issue a new circular describing their line of Never-Break hollow-ware, in which illustrations are given of the different articles they are now putting on the market. Among these are those given below, which

Fig. 1.—Section of Kettle.

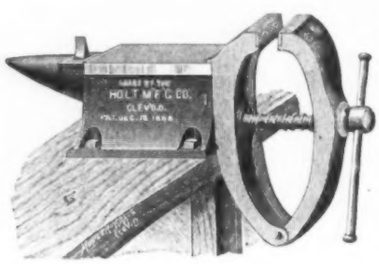
give sectional views (Fig. 1) of a kettle and (Fig. 2) of a spider. The object of these illustrations is to illustrate clearly the fact that the metal is exactly the same thickness all over. In reference to this feature of the goods the company state

Fig. 2.—Section of Spider.

that the metal is put into the required shape from the flat sheet without displacing any of the metal, leaving it the same thickness as in the original sheet. In order to substantiate this claim they suggest that any of the Never-Break goods be taken from any stock and cut as shown in the illustration.

The Holt Combined Anvil and Vise.

The accompanying illustration represents an anvil and vise put on the market by the Holt Mfg. Company, Cleveland, Ohio. In this tool the anvil or vise may be used independently of each other, and



The Holt Combined Anvil and Vise.

the manufacturers emphasize the fact that the face of the anvil is chilled. The article is not placed on the market to compete with any low-priced goods, but is intended to sell at a price high enough to warrant the company in keeping up the standard of quality. The anvil is described as made of best quality car-wheel iron, the face being highly polished and thoroughly chilled, as alluded to above. The hardie, which is made of English tool steel, is 5½ inches long, weighs ½ pound and fits squarely in ½-inch hole in anvil, cut true, thereby allowing bolts and rods to be headed squarely. The vise has steel jaws hand cut and hardened in oil. It is so made that it can be separated from the anvil by simply driving out the key, this arrangement permitting the separate use of either anvil or vise to straighten a long bar of iron or as a separate clamp. The back jaw of vise has a lip projecting over upon the anvil, which, with two guides at the bottom of the anvil, keeps the vise plumb. Thus the entire force of blows on any substance held in the jaws of the vise is sustained simultaneously by the heavy key that fastens the anvil and vise together, by the lip projecting over the anvil and by the two guides on the bottom of the anvil. This arrangement is referred to as securing great strength, which will sustain sledge-hammer blows without damage. The spring is of the most approved kind, having malleable-tipped handle and a ⅞-inch screw 13 inches in length. Four sizes of these goods are made, Nos. 10, 25, 40 and 75, weighing respectively 10, 25, 40 and 75 pounds.

Hooks for Plumbing-Work.

Some new goods of especial interest to the plumbing trade are being put on the market by Thomas Devlin & Co., Lehigh avenue, American and Third streets, Philadelphia, Pa. Fig. 1 illustrates the Eclipse Gas-Pipe Hook, which is made of wrought-iron in eight sizes, from ¼ inch to 2 inches. These hooks have a strengthening-rib on the back, though the cut does not show it. The Eclipse Soil-Pipe Hook, shown in Fig. 2, is made of the best quality of Bessemer steel in 2, 3, 4, 5 and 6 inch sizes. The Eclipse Plumber-Hook, Fig. 3, of the same sort of steel, is made in four sizes, from ½ inch to 1¼ inches. We learn from the manufacturers that heretofore such goods have been imported or else made by hand by blacksmiths, but that the Eclipse hooks are shaped, forged and bent by machinery, the only hand labor required being the feeding of the machine.

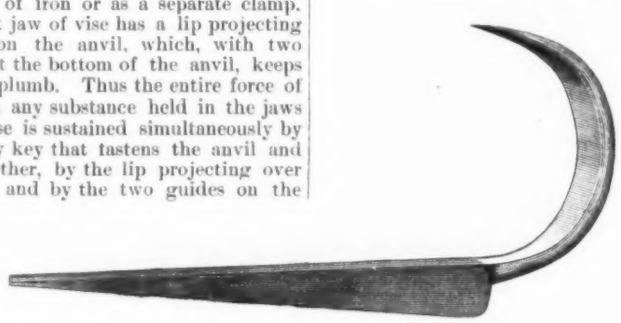


Fig. 1.—Eclipse Gas-Pipe Hook.

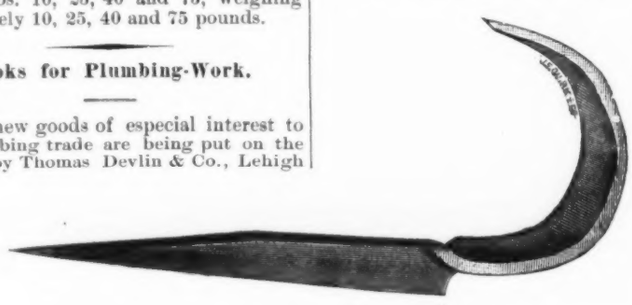


Fig. 2.—Eclipse Soil-Pipe Hook.

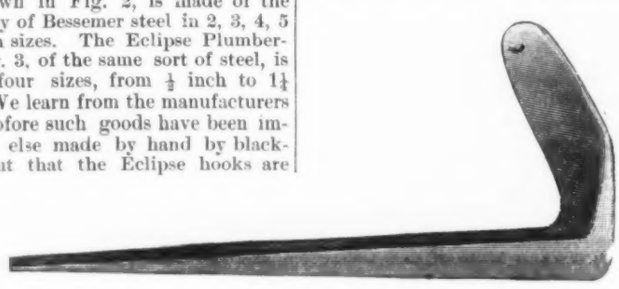


Fig. 3.—Eclipse Plumber Hook.

What a Fire-Proof Building Is.—The Boston *Herald* explains what a fire-proof building is after stating that not one of the buildings recently burned in that city was of the character described. We copy as follows, although it must not be inferred that it was necessary to go to Boston for the information: "Brick and tile are made of such shapes and sizes that they may be formed into arches between the iron I-beams forming the frame-work of the floors. In some buildings these floor arches are constructed of brick, resting upon the flanges of the I-beams, and are round or 'turned,' as builders say, like any other arches. The floors and ceilings are then leveled by filling in both the concave and convex surfaces of the arches between the beams with cement or other non-combustible material. When hollow tiles are used, however, they make what is termed a 'flat arch,' which is really an arch, keystone and all; but from the peculiar shapes of the tiles it is already filled out so as to be level on both the upper and the lower faces. Now, whether brick or tile be used for the floor arches, they are covered with a layer of cement in which the floor-joists are laid. No wood at all would be used were it not necessary to have these joists to nail the floor planking upon. Sometimes, indeed, the floors are laid, not in plank, but in flat ornamental tiles. Still, this construction is not necessary to make the flooring essentially fire-proof. In addition to this sort of flooring the fire-proofed building has brick or tile partitions, and either brick columns or else iron columns sheathed in brick or tile. Tile is manifestly superior to brick for arches and partitions, both on account of its comparative lightness and its excellence as a non-conductor of heat. It has been in common use only a few years, and has almost entirely taken the place of brick for the purposes for which it is intended. Carefully made tile is, of course, proof against injury by heat; and it so resists the pas-

sage of heat through it that, when used as sheathing for iron columns and girders, it will protect them for a long time from the effects of the fiercest fire."

Allis' Steel Barbed and Ornamental Fencing.

The accompanying illustration represents another style of this fencing, in addition to those illustrated in our last issue, as invented by T. V. Allis, 12 East Thirty-first street, New York. In last week's issue of *The Iron Age* by typographical error we said that Mr. Allis' solid steel

Allis' Steel Barbed and Ornamental Fencing.

barbed fencing averaged in weight 1 pound and 8 ounces per rod (16½ feet). The statement should read "1 pound and ⅛ ounce per rod." The error thus made was peculiarly misleading, inasmuch as one of the points emphasized by Mr. Allis is the light weight of this fencing in comparison with barb-wire. This point is made clear by the following table, in which Mr. Allis' fencing is compared with barb-wire of standard makes. The above cut reduced in size from the actual sample furnished us portrays the lightest weight of barbed fencing proposed to be manufactured by Mr. Allis, New York, and weighs but 13¾ ounces per rod, while the average tensile strength per strand, as shown by 21 tests, is 1530 pounds. By permission, we print above from Mr. Allis' catalogue a table for convenient reference, giving the contents in rods and feet of a 100-pound spool of different makes and styles of barbed fencing.

1 spool T. V. Allis' solid steel	weighing	13¾	oz. per rod contains about 1922 ft., or	116⅔	rods.
1 spool T. V. Allis' solid steel	weighing	14⅛	oz. per rod contains about 1869 ft., or	113¾	rods.
1 spool T. V. Allis' solid steel	weighing	14⅜	oz. per rod contains about 1837 ft., or	111⅓	rods.
1 spool T. V. Allis' solid steel	weighing	14¾	oz. per rod contains about 1807 ft., or	109⅓	rods.
1 spool T. V. Allis' solid steel	weighing	15¼	oz. per rod contains about 1745 ft., or	105¾	rods.
1 spool T. V. Allis' solid steel	weighing 1 lb.	⅛	oz. per rod contains about 1638 ft., or	99¼	rods.
1 spool T. V. Allis' solid steel	weighing 1 lb.	3⅜	oz. per rod contains about 1345 ft., or	81½	rods.
1 spool barbed wire	weighing 1 lb.	3-16	oz. per rod contains about 1631 ft., or	98⅞	rods.
1 spool barbed wire	weighing 1 lb.	1	oz. per rod contains about 1553 ft., or	94 1-10	rods.
1 spool barbed wire	weighing 1 lb	2	oz. per rod contains about 1467 ft., or	88⅞	rods.
1 spool barbed wire	weighing 1 lb.	2 3-16	oz. per rod contains about 1452 ft., or	88	rods.
1 spool barbed wire	weighing 1 lb.	3	oz. per rod contains about 1389 ft., or	84 1-5	rods.
1 spool barbed wire	weighing 1 lb.	3⅛	oz. per rod contains about 1328 ft., or	80⅘	rods.
1 spool barbed wire	weighing 1 lb.	4	oz. per rod contains about 1320 ft., or	80	rods.
1 spool barbed wire	weighing 1 lb.	4⅛	oz. per rod contains about 1312 ft., or	79½	rods.
1 spool barbed wire	weighing 1 lb.	4¼	oz. per rod contains about 1287 ft., or	78	rods.
1 spool barbed wire	weighing 1 lb.	4⅜	oz. per rod contains about 1280 ft., or	77½	rods.
1 spool barbed wire	weighing 1 lb.	5	oz. per rod contains about 1257 ft., or	76 1-5	rods.
1 spool barbed wire	weighing 1 lb.	6⅛	oz. per rod contains about 1180 ft., or	71½	rods.

Contents of a 100-Pound Spool of Barbed Fencing.

Electrical Notes.

About 300,000 telephones are now in use in this country alone. The telephone and the type-writer are modern business conveniences which have sprung into use almost simultaneously, and it would be difficult to say which could be spared most easily. The field of application for the telephone, however, is constantly growing wider, and every day witnesses greater dependence upon it in the conduct of business operations. More than 170,000 miles of telephone wire are estimated to be in operation in this country at present. Long-distance telephoning is rapidly coming into play and is proving very acceptable to a large class of business men. Thus far the longest distance reported over which conversation by telephone is daily made is between Portland, Maine, and Buffalo, N. Y., which are about 750 miles apart. It is expected that New York City and Chicago will shortly be connected for this purpose.

The telephone instead of supplanting the telegraph is merely supplementing it. Both these means of annihilating space have their special fitness in business communications, and interfere as little with each other as do the elevated and surface roads of New York City. Business for each grows with the improved facilities afforded. Over 1,000,000 miles of telegraph wire are now in operation in the United States—enough to encircle the globe 40 times. Between the leading cities of the country the telegraph service has attained vast proportions, and though the quadruplex system of telegraphy enables four messages to be transmitted over one wire at a time, the number of wires in use is constantly being increased to keep pace with the growth of the business. The most widely separated points between which it is possible to send a telegram are British Columbia and New Zealand via America and Europe.

About 400 miles of electric railway are now in operation in this country and many more miles are under construction. The systems which have thus far been reduced to practice are more suited to cities of 20,000 to 50,000 inhabitants than to very large centers of population, but they are making their way into some of the leading cities of the country and will in time develop methods of electrical conveyance and application which will overcome present objections to their use. The fastest record time made by an electric railway is about 20 miles an hour on a street-car system.

The application of electricity as a means of transmitting power in factories is rapidly on the increase. A firm of ready-made clothiers, of Leeds, England, are building a factory in which about 800 sewing-machines will be employed, as well as the necessary number of cutting-machines to keep these going. All these will be operated by electric motors, it having been found on calculating the relative cost that it will be more economical to fit up the building in this way than to furnish it with shafting and all the necessary adjuncts.

Electric lighting has been a wonderful stimulant to business of many kinds since it was first reduced from a phenomenon of the laboratory to an adjunct of every-day life. Not only have engine-building and other essential industries been greatly stimulated, but an incalculable benefit has been derived from the rapid spread of electric lighting by the greater mechanical precision called for in the manufacture of the necessary apparatus. A higher order of skill and, of course, an increased modicum of intelligence have been required from mechanics employed in this direction. The average engines built in the United States to-day are better by far than they would have been with all our progressive ideas and inventive genius if electric lighting had not played such an important part with us in the last decade.

The magnitude of the electrical industry is shown by the estimate made, presumably by persons well informed on the subject, that some 250,000 persons are now engaged in business in this country depending solely on electricity.

Southern Freight Rates.

The Richmond and Danville Railroad Company have issued a pig-iron tariff, advances to take effect December 9 and reductions December 2, on carload lots of 17½ tons of 2268 pounds from furnaces in the Birmingham district to points in Colorado, Illinois, Kansas, Kentucky, Minnesota, Missouri, Nebraska, Tennessee, Wisconsin and Wyoming. The following are the rates to some of the leading points from the Birmingham and from the Anniston districts:

To	From Birmingham.	From Anniston.
Atchison, Kan.	$5.79	$5.79
Belleville, Ill	3.55	3.55
Chicago, Ill.	4.30	4.55
Council Bluffs, Iowa	5.79	5.79
Dayton, Ohio.	3.80	3.80
Denver, Col.	11.37	11.37
Detroit, Mich.	4.30	4.55
East St. Louis, Ill.	3.55	3.55
Fort Wayne, Ind.	4.05	4.30
Grand Rapids, Mich.	5.05	5.05
Hegewisch, Ill.	4.30	4.55
Joliet, Ill.	4.30	4.55
Kansas City, Mo.	5.79	5.79
Leavenworth, Kan.	5.79	5.79
Lima, Ohio.	4.05	4.05
Milwaukee, Wis	4.70	4.95
Muncie, Ind	3.55	3.80
Omaha, Neb.	5.79	5.79
Ottumwa, Iowa.	5.58	5.58
Rock Island, Ill.	5.07	5.07
Springfield, Ill.	4.30	4.55
St. Joseph, Mo.	5.79	5.79
St. Louis, Mo.	3.55	3.55
St. Paul, Minn.	6.18	6.18
Toledo, Ohio	4.30	4.30
Topeka, Kan.	7.60	7.60
Wyandotte, Mich.	4.30	4.55
Zanesville, Ohio.	4.30	4.30

William N. Page has leased the Hawk's Nest coal property and plant at Ansted, Fayette County, W. Va., for a period of 15 years, with the option of purchase. He has organized a company—the Gauley Mountain Coal Company—and is preparing for an output of 2000 to 5000 tons per day. The present capacity of the mine, which has been idle for several years, is about 500 tons. We are informed that the company are sold ten years ahead and that the Chesapeake and Ohio Railway have agreed to replace the narrow with a standard gauge, which is to be operated free of expense to the company. This completion is promised by the 1st of March. The Gauley Mountain seam is 11 feet thick and, like the Connellsville coal, can be mined easily without the use of powder or the expenditure of much labor in undercutting. An ordinary miner will average 12 tons daily, while some will lead from 15 to 20 tons; so that at 25 cents per ton the wages range from $3 to $5, with nothing but oil to be deducted.

A naval board, consisting of Chief Engineer Stevens and Assistant Constructor Wood, has been ordered to examine the plant of Samuel L. Moore, Sons & Co., of Elizabethport, N. J., and report as to their capacity for constructing gun-boats Nos. 5 and 6, for which work they desire to bid.

The fire in the Anaconda Copper Mine was supposed to have been extinguished, but broke out again as soon as the bulkheads were removed.

Joule's Work in Electricity.

At the recent meeting of the Institution of Electrical Engineers, England, Sir William Thomson said the science of electricity was as old as human learning. In the remotest times Greek and Arabian philosophers had something of our present electrical knowledge. Last century was full of work of pure electrical knowledge, but what was most remarkable was the tremendous development it had received since 1819. In 1837 the electric telegraph came into existence, and although he did not say it was invented by Cooke and Wheatstone, it became a practical servant for man through their labors.

The great scientific discoveries of Faraday, which were prepared almost deliberately for the purpose of allowing others to turn them to account for the good of man, had been going on for about 15 years when a young man took up the subject with a profound and penetrating genius most rare in any branch of human study, and perceived relations with mechanical power which had never been suspected before. Joule saw the relations between electricity and force, and his very first determination of the mechanical equivalent was an electrical measurement. His communication to the British Association when it met in Cork in the year 1841 pointed out for the first time the distinct mechanical relation between electric phenomena and mechanical force. Joule was not a mere visionary who saw and admired something in the air, but he pursued what he saw to the very utmost practical point of work, and he it was who determined the mechanical equivalent of heat. Afterward he thoroughly confirmed the principle of his first determination of the mechanical equivalent of heat. Both in electricity and mechanical action he laid the foundation of the great development of thermo-dynamics, which would be looked upon in future generations as the crowning scientific work of the present century. It was not all due to Joule, but he had achieved one of the very greatest monuments of scientific work in the present century. For an institution of electrical engineers it was interesting to think that the error relating to one of the most important electrical elements, the unit of resistance—now called the ohm—as determined electrically in the first place by a committee of the British Association, and by purely electrical method, was first discovered by Joule's mechanical measurement. It was Joule's mechanical measurement which first corrected the British Association unit and gave the true ohm.

A suit for $2,500,000 has been begun by the Tennessee Coal, Iron and Railway Company against John V. Inman. It grows out of transactions in connection with the consolidation of the Pratt Coal and Iron Company and the Tennessee Company.

"The movement for eight hours," Andrew Carnegie says, "is out of order. Too many men are required to work 12 hours and more. To reduce the hours of labor 20 per cent. at a bound would not be evolution, but revolution. It would fail utterly and leave the cause of labor in a worse position than before. Establishments which run night and day should run with three sets of men, instead of two shifts, as at present. That is the first step that should be taken. We tried to enforce this for two years at our blast-furnaces, hoping that labor would compel our competitors to follow; but not one outside of Pittsburgh did and we had to give it up. Labor can never agree with itself. Some manufacturers have no difficulty in getting their labor to work 12 hours. Of course no one manufacturer can afford to work three sets of men while his competitors work two unless labor consents to take less wages for shorter hours, and that it never has done. I give little heed to the movements of men who propose impracticable things. The eight-hour movement is impracticable and nothing can come of it. The movement is only froth, and will pass away just as trusts are passing away."

Life of Heavy Guns.

It is stated that a 110-ton Armstrong gun has bent during test, says the *Engineer*, from which we take the following particulars regarding the life of heavy guns: It appears that the 110-ton gun—16¼ inches—will fire 95 ordinary rounds, after which the gun is unfit for service. The 67-ton gun, 13½ inches, will fire 127 rounds, and the 45-ton gun, 12 inches, will fire 150 rounds, after which these guns are absolutely unfit for service. The cost of the 110-ton gun is £16,500, the 67-ton gun £10,900 and the 45-ton gun £6300. Thus the cost of the 110-ton gun alone will be for each discharge of shot £174, for the 67-ton gun £86 and for the 45-ton gun £43. The cost of a single round for material alone for the 110-ton gun is as follows:

	£	s.	d.
900 pounds of powder	70	0	0
1800 pounds of projectile	80	0	0
Silk for cartridge	3	0	0
Deterioration of gun (life of gun taken at 95 rounds)	174	0	0
Total net cost of each round	327	0	0

For the 67-ton gun:

	£	s.	d.
520 pounds of powder	40	10	0
1250 pounds of projectile	55	10	0
Silk for cartridge	2	0	0
Deterioration of gun (life of gun taken at 127 rounds)	86	0	0
Total net cost of each round	184	0	0

For the 45-ton gun:

	£	s.	d.
295 pounds of powder	23	0	0
714 pounds of projectile	31	0	0
Silk for cartridge	1	0	0
Deterioration of gun (life of gun taken at 150 rounds)	43	0	0
Total net cost of each round	98	0	0

The 67-ton gun would penetrate 27 inches of wrought-iron at 1000 yards, and the 45-ton gun would penetrate 20 inches of wrought-iron at the same distance.

It is reported that one of the great Eastern steel companies has accumulated purchases of foreign ore, until now the total reaches 750,000 tons, the arrangement being made that it need be moved only when the works want it and ocean freights are favorable.

The National Metal Edge Box Company, of Philadelphia, have just issued their 1890 catalogue. In this they show their scoring and channel-grooving machine, which is constructed for either foot or steam power and is furnished with two complete sets of scoring and grooving knives, 12 assorted plows, 4 extra knives and 1 wheel for imprinting the patent marks. There are also illustrations of metal-fastening machines, which are intended for putting metal corners on the corners of boxes. Boxes which are re-enforced by these metal corners are stronger and neater in appearance than the ordinary ones, and the cost of production is very reasonable. These metal edges, which are strips of metal bent longitudinally to form an angle and serrated on both edges and the teeth of which are bent to enter the wood, are secured to the box corners by the above-mentioned machines, which are also adapted for fastening the metal on the bottom edges of boxes and around the corners. The company also make cutters and shears of several styles.

As an indication that the considerable difference between the prices of iron and steel is beginning to tell, we may note the report that a large Wheeling mill is getting ready to turn back to iron nails with the beginning of the next year.

It is reported that there is on the tapis a consolidation of the Cleveland Rolling Mill Company, the HP. Nail Company, and the American Wire Company, all large Cleveland concerns.

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CURRENT HARDWARE PRICES.

DECEMBER 11, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.—

Caps, Percussion, ₱ 1000—

Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35¢
E. B. Trimmed Edge, 1-10's.....46@48¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....46@47¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.00

Cartridges.

Rim Fire Cartridges.....50&5&2 %
Rim Fire Military.....15&2 %
Cent. Fire, Pistol and Rifle.....25&5&2 %
Cent. Fire, Military and Sporting.....15&5&2 %
Blank Cartridges, except 22 and 32 cal., additional 10 % on above discounts.
Blank Cartridges, 22 cal., $1.75.....2 %
Blank Cartridges, 32 cal., $3.50.....2 %
Primed Shells and Bullets.....15&5&2 %
B. B. Caps, Round Ball, $1.75.....2 %
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—

Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00.....2%
All other Primers, $1.20.....2%

Shells—

First quality, 4, 8, 10 and 12 gauge.....25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Star, Club, Rival and Climax brands.....20&10&2%
Selbold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.....65&2%
I X L, 10 and 12 guage.....40&5&2%
"Special," 16 gauge.....30&10&5&2%
"Special," 10 and 12 gauge.....40&10&2%
Fowler's Pat.....$3.25

Shells Loaded—

Standard. List.....40@40&5%

Wads—

U. M. C. & W. R. A.—B. E., 11 up..$2.00
U. M. C. & W. R. A.—B. E., 9&10.. 2.30
U. M. C. & W. R. A.—B. E., 7&8... 2.60
U. M. C. & W. R. A.—P. E., 11 up.. 3.10
U. M. C. & W. R. A.—P. E., 9&10.. 4.00
U. M. C. & W. R. A.—P. E., 7&8... 4.90
20@22%
Eley's B. E., 11 up.....$1.75
Eley's P. E., 11@20..... 2.80

Anvils.—

Eagle Anvils, ₱ ℔ 10¢.....20@20&5%
Peter Wright's.....10½¢
Armitage's Mouse Hole.....8¾¢
Armitage's Mouse Hole, Extra.....11½¢
Trenton.....9½@9¾¢
Wilkinson's.....9¾@10¢
J. & Riley Carr, Pat. Solid.....11@11½¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%

Apple Parers—

Advance.....₱ doz $4.75
Antrim Combination.....₱ doz 5.50
Baldwin.....₱ doz 5.25
Champion.....₱ doz 7.25
Daisy.....₱ doz 4.00
Eureka, 1888.....each 17.00
Family Bay State.....₱ doz 12.00
Favorite.....₱ doz 5.00
Gem.....₱ doz 5.25
Gold Medal.....₱ doz 4.00
Ideal.....₱ doz 4.00
Improved Bay State.....₱ doz 30.00
Little Star.....₱ doz 4.50
Monarch.....₱ doz 13.50
New Lightning.....₱ doz 5.50
Oriole.....₱ doz 4.00
Penn.....₱ doz 4.00
Perfection.....₱ doz 4.00
Pomona.....₱ doz 4.00
Rocking Table.....₱ doz 6 00
Turntable.....₱ doz 4.50
Victor.....₱ doz 13.50
Waverly.....₱ doz 4.00
White Mountain.....₱ doz 4.50
72.....₱ doz 4.25
76.....₱ doz 5.75
78.....₱ doz. 6.50

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co. } 70%
French, Swift & Co. (F. H. Beecher, Rockford Bit Company
Cook's, Douglass Mfg. Co.....55 %
Cook's, N. H. Copper Co.50&10&50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₱ set, 32½ quarters, No. 5, $5; No. 30, $3.50.20%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits....25%
Imitation Jennings' Bits.....60@60&5%
Pugh's Black.....20%
Rockford, Jenning's Pattern.....60%
Car Bits.....50&10&60%
L Hommodieu Car Bits.....15&10%
Worstner Pat. Auge Bits.....10%
Cincinnati Bell-Hangers' Bits.....30%

Hollow Augers—

Ives'
French, Swift & Co. } 33⅓ @
Douglass' } 33⅓&10%
Bonney's Adjustable, ₱ doz $48...40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25&25&10%
Cincinnati Adjustable.....30&30&5%
Cincinnati Standard.....25&10%

Expansive Bits—

Clarks' small, $18; large, $26...35@35&5%
Ives' No. 4, ₱ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common.....₱ gross $2.75@$3.25
Diamond.....₱ doz $1.10....25&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co...30&10%
Double Cut, Hartwell's, ₱ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood...40&10%
Cincinnati, for wood.....30&5%
Cincinnati, for metal.....40&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—

Sewing, Brass Fer. ₱ gr, $3.50.....45&10%
Pat. Sewing, Short. $1.00 ₱ doz,....40&10%
Pat. Sewing, Long.....₱ doz $1.20
Pat. Peg, Plain Top. ₱ gr $10.00...45&10%
Pat. Peg, Leather Top. ₱ gr $12.00.45&10%

Awls, Brad Sets, &c—

Awls, Sewing, Common ₱ gr $1.70, 35%
Awls, Should. Peg. ₱ gr $2.45, 40@40&10%
Awls. Pat. Peg... ₱ gr 63¢....40@40&10%
Awls, Shouldered Brad...2.70 ₱ gr.....35%
Awls, Handled Brad...$7.50 ₱ gr.....45%
Awls, Handled Scratch ₱ gr, $7.50.35&10%
Awls, Socket Scratch, ₱ doz, $1.50.25&30%

Awl and Tool Sets—

Aiken's Sets, Awls and Tools, No. 20, ₱ doz $10.00.....55&10%
Gray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9.....25@25&10%
Miller's Falls Adj. Tool Hdls.. Nos. 1, $12. 2, $18.....25%
Henry's Combination Haft...₱ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50...70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....30&10%

Axes—

Makers' and Special Brands—

First quality.....₱ doz $6.00@$6.50
Others.....₱ doz $5.50@$5.75

Axle Grease—

Fraser's.....Keg ₱ ℔ 4¢, Pail ₱ ℔ 5¢
Fraser's, in boxes.....₱ gr $9.50
Dixon's Everlasting, in bxs...₱ doz 1 ℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting....10-℔ pails, en. 85¢
Lower grades, special brands, ₱ gr $5.50@$7.00

Axles—

No. 1,4¢@4½¢, No. 2 5¼¢@5½¢ } 3 % cash
Nos. 7 to 14.....55&5%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
National Tubular Self-Oiling: Standard Farm (1 to 5) and Special Farm (A1 to A5):
Less than 10 sets.....33⅓%
Over 10 sets.....33⅓&5%

Bag Holders.—

Sprengle's Pat.....₱ doz $18.....60%

Balances—

Spring Balances.....50%
Common 24-℔.....₱ doz $1.50.....50%
Chatillon's Spring Balances.....50%
Chatillon's Circular Spring Balances.60%

Bells—

Hand—

Light Brass.....70&10 @ 75%
Extra Heavy.....60&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe (Cone's Patent).....25&10@35%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank Cone's.....10%
Crank, Counel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Cow—

Common Wrought.....60&10%
Western.....20&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Dodge, Genuine Kentucky....70&70&10%
Texas Star.....50&10@50&10&5%
Call.....40@40&5%
Farm Bells.....₱ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....60@60&5%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70&10%
Standard.....70&70&5%
Extra.....60&5@60&10%
N. Y. B. & P. Co., Carbon.....60&10&5%
N. Y. B. & P. Co., Diamond.....50&10%

Bench Stops—

Morrill's.....₱ doz $9, 50%
Hotchkiss's.....₱ doz $5, 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's.....₱ doz $3.....10%
Cincinnati.....25&10%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—

Extension,
Barber's, ₱ doz $15.00.....40@40&10%
Ives, ₱ doz $20.00.....60&5@60&10%
Diagonal.....₱ doz $24.00, 40%
Angular.....₱ doz $24.00, 40&5%

Blind Adjusters—

Domestic.....₱ doz $3.00, 33⅓%
Excelsior.....₱ doz $10.00.....50&10&2%
Washburn's Self-Locking.....20@20&10%

Blind Fasteners—

Mackrell's, ₱ doz, $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ₱ gr..60&10%
Van Sand's Old Pat., $15.00 ₱ gr..55&10%
Washburn's Old Pattern, ₱ gr.....$9.00
Merriman's.....new list
Austin & Eddy No. 2008, ₱ gr.....$9.00
Security Gravity, ₱ gr.....$9.00

Blind Staples—

Barbed, ½ in. and larger.....₱ ℔ 7½@8¢
Barbed, ⅝ in.....₱ ℔ 8½@9¢

Blocks—

Ordinary Tackle, list May 20, 1889...50%
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%

Bolts—

Door and Shutter—

Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....55&10%
Wr't Sunk Flush, Stanley's list....50&10%
Wr't B.K.Flush, Com'n " ....55&10%

Carriage, Machine, &c.—

Com. list June 10, '84.....70&12½&2%
Genuine Eagle, list Oct., '84...75&10@80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list.....70%
Machine, according to size...75&10@80%
Bolt Ends, according to size..75&10@80%

Tire—

Common, list Feb. 28, '83.....67½%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....67½%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phil., list Oct. 16, '84.....75%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....67½%
R.B.&W., Philadel., list Oct. 16, '84....80%

Stove and Plow—

Stove.....62½%
Plow.....60&5%
R. B. & W., Plow.....55%

Borax.....₱ ℔ 9½@10½¢

Boring Machines—

	Without Augers.	Upright.	Angular.
Douglass		$5.50	$6.75.....50%
Snell's, Rice's Pat.	5.50	6.75	...40&10&10
Jennings	5.50	6.75	...45@45&10
Other Machines	2.35	2.75	..... net
Phillips' Patent with Augers	6.00	7.50	.....

Bow Pins—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co's....$17 and $18.....60&10%
Peck, Stow & W. Co....50&10&50&10&5%

Braces.—

Barber's,
Nos. 10 to 16.....10%
Nos. 30 to 33.....50%
Nos. 40 to 63.....50&10%
Barker's,
Nos. 8, 10 and 12.....75&10@80%
Plated, Nos. 8, 10 and 12....65&10@70%
Osgood's Ratchet.....40&10@50%
Spofford's.....50&5@50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Common Ball, American.....$1.00@$1.10
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
P. S. & W.....50&10%

Brackets—

Shelf plain, Sargent's list, 55&10@55&10&10%
Shelf, fancy, Sargent's list, 60&10@60&10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....60&10@60&10&10%

Bright Wire Goods.....85%

Broilers—

Henis' Self-Basting. } Inch..... 9 10 9x11
} Per doz...$4.50 5.50 6.50

Buckets—See Well Buckets and Pails.

Bull Rings—

Union Co. Nut.....55%
Sargent's.....66⅔&10@70&5%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70%
Peck, Stow & W. Co's..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list, 50@50&10%

Butcher's Cleavers—

Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P. S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Butts—

Brass—

Wrought Brass.....75@75&10%
Cast Brass, Tiebout's'.....33⅓%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60&5%
Fast Joint, Broad.....55&10&5@60&10%
Loose Joint.
Loose Joint, Japanned.
Loose Joint, Jap. with Acorns.
Parliament Butts. } ,70&5@
Mayer's Hinges. } 70&10%
Loose Pin, Acorns.
Loose Pin, Acorns, Japanned.
Loose Pin, Acorns, Japanned, Plated Tips.

Wrought Steel—

Fast Joint, Narrow.
Fast Joint, Lt. Narrow.
Fast Joint, Broad.
Loose Joint, Broad. } ,70&5@
Table Butts, Back Flaps, &c. } 70&10%
Inside Blind, Regular.
Inside Blind, Light.
Loose Pin.
Bronzed Wrought Butts.....50%

Calipers—

See Compasses.

Calks, Toe—

Gautier.....₱ ℔ 5½@6¢
Dewicks (Burke).....₱ ℔ 5½@6¢

Can Openers—

Messenger's Comet.....₱ doz $3.00, 25%
American.....₱ gross $3.00
Duplex.....doz 25¢, 15@20%
Lyman's.....₱ doz $3.75, 20%
No. 4 French.....₱ doz $2.25, 55@60%
No. 5, Iron Handle.....₱ gr $6.00, 45@50%
Eureka.....₱ doz $2.50, 10%
Sardine Scissors.....₱ doz $2.75@3.00
Star.....₱ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50 50&10&10%
World's Best, ₱ gross, No. 1, $12.00 · No. 2, $24.00; No. 3. $36.00.....50&10%
Universal, ₱ doz $3.00.....35&5%
Domestic, ₱ doz $2.50.....40%
Champion ₱ doz $2.00.....50¢

Cards—
Horse & Curry.....10@10@10&10@10%
Cotton.....10@10@10%
Wool.....10@10@10%

Carpet Stretchers—
Cast Steel, Polished.....₱ doz $2.25
Cast Iron, Steel Points.....₱ doz 80¢
Socket.....₱ doz $1.75
Bullard's.....25@25&10%

Carpet Sweepers—
Bissell No. 5.....₱ doz $17.00
Bissell No. 7 New Drop Pan.....₱ doz $19.00
Bissell, Grand.....₱ doz $36.00
Grand Rapids.....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00.....
Magic.....₱ doz $15.00
Jewel.....₱ doz $17.00
Improved Parlor Queen,
Nickeled.....₱ doz $27.00
Japanned.....₱ doz $24.00
Excelsior.....₱ doz $22.00
Garland.....₱ doz $18.00
arlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00
Weed, Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog-Wheel.....₱ doz $16.00
Conqueror.....₱ doz $22.00
Easy.....₱ doz $22.00
Monarch.....₱ doz $22.00
Goshen.....₱ doz $21.00
Advance.....₱ doz $18.00
Ladies' Friend, No. 1, ₱ doz, $15.00; No. 2.....₱ doz $16.00
American.....₱ doz $15.00
Grand Republic.....₱ doz $35.00

Cartridges—
See Ammunition.

Casters—
Bed..... } Brass....55&55&10%
Plate..... } Others...60&60&10%
Shallow Socket.....
Deep Socket.....40&10%
Yale Casters, list May, 1884.....30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10@50%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30%
Stationary Truck Casters.....50@10%
Socket Truck Casters.....50%

Cattle Leaders—
Humason, Beckley & Co.'s.....70%
Sargent's.....60&5&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....50&10%

Chain—
Trace, 6½-10-2, exact, ₱ pair, $1.03.....50&10@50&10&5%
Trace, 6½-10-3, exact, ₱ pair 92¢.....50&10@50&10&5%
Trace, 7-10-2, exact, ₱ pair $1.11.....50&10@50&10&5%
NOTE.—Traces, "Regular" sizes, 3¢ net ₱ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, List Nov. 1, 1884.....50&10@50&10&5%

American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$3.00	5.70	4.80	4.20	3.90	3.75	3.65	3.55

Less than cask lots, add ½¢@½¢ ₱ ℔.
German Coil, list of June 20, 1887.....50&10&5@60%
German Halter Chain, list of June 20, 1887.....50&10&5@60%
Covert Halter.....60@2%
Covert Traces.....35@2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₱ ℔ 5@5&5¼¢
Jack Chain, Iron.....75@75&5%
Jack Chain, Brass.....70@70&5%

Chalk—
White.....₱ gr 50¢
Red.....₱ gr 70¢
Blue.....₱ gr 85¢
See also Crayons.

Chalk Lines—
See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W.....
New Haven.....
Witherby.....
Mix.....
Ohio Tool Co.....
..75 @ 75&10%
Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60@10@60&10&5%
L. & I. J. White.....30@30&5%
Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to £
Buck Bros.....30%
Cold Chisels, ₱ ℔.....16@19¢

Chucks—
Beach Pat.....each, $8.00.....20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Bals Pat.....25%
Skinner's Pat. Drill Chucks.....30%
Skinner's Independent Lathe Chucks.40%
Skinner's Pat. Comb. Chuck.....40%
Union Mfg. Co.,
Victor.....$8.50, 25%
Combination.....40%
Universal.....40%
Independent.....4 %

Clamps—
R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....20&10%
Stearn's Adjustable Cabinet and Corner.....20&10%
Cabinet, Sargent's.....60%&10%
Carriage Makers', Sargent's.....70&10%
Eberhard Mfg. Co.....40&5&40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises.
Carpenters', Cincinnati.....1.5%

Clips—
Norway, Axle, ½ ₱ 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16.....65&5%
Superior Axle Clips.....65%&5&70%
Norway Spring Bar Clips, 5-16..60&5&5%
Wrought-Iron Felloe Clips.....₱ ℔, 5½¢
Steel Felloe Clips.....₱ ℔, 5¢
Skein Axle Clips.....55%

Cockeyes.....50%

Cocks, Brass.
Hardware list.....50&2%

Coffee Mills—
Box and Side, List Jan. 1, 1888.....60&2%
American, Enterprise Mfg. Co.20&10&30%
The Swift, Lane Bros.....20&10%

Compasses Dividers, &c—
Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers 25&10&10%
Lock Calipers and Dividers.....25&10%
Combination Dividers.....25&10%

Coopers' Tools—
Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....20%

Corkscrews—
Humason & Beckley Mfg. Co..40@40&10%
Clough's Pat.....33⅓@33⅓&5%
Howe Bros & Hulbert.....35%

Corn Knives and Cutters—
Bradley's.....10%
Wadsworth's.....25%

Cradles—
Grain.....50&5&2 @ 50&10&2%

Crayons.
White Crayons, ₱ gr 12¢@12½¢.....10%
D. M. Stewart Mfg. Co., Metal Workers, ₱ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₱ gr, $2.50.....25%
See also Chalk.

Crow Bars—
Cast Steel.....₱ ℔ 4½¢
Iron, Steel Points.....₱ ℔ 3½¢

Curry Combs—
Fitch's.....50&10@50&10&10%
Rubber per doz $10.00.....20%
Perfect.....50%

Curtain Pins—
Silvered Glass.....net
White Enamel.....net

Cutlery—
Beaver Falls & Booth's.....33⅓
Wostenholme.....$7.75 to £

Dampers, &c—
Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Dividers—
See Compasses.

Dog Collars—
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%

Door Springs—
Torrey's Rod, regular size....₱ doz $1.30
Gray's, ₱ gr., $20.00.....20%
Bee Rod ₱ gr., $20.00.....20%
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30.....40&10&50%
Gem (Coil), list April 19, 1886.....10%
Star (Coil), list April 19, 1886.....20%
Victor (Coil).....60@60&10%
Champion (Coil).....60&10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75.. %
Cowell's....No. 1, ₱ doz, $18.00; No. 2, $15.00.....50%
Rubber, complete, ₱ doz, $4.50...55&10%
Hercules.....50%
Shaw Door Check and Spring.25@30@35%

Drawing Knives—
Witherby.....
P. S. & W.....
Mix.....
New Haven.....
..75@ 75&10%
Merrill.....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Drills and Drill Stocks—
Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's.....each $2.50, 25&10&40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20@20&5%
Ratchet, Whitney's.....20&10%
Ratchet, Weston's.....20@25%
Ratchet, Moore's Triple Action...25@30%
Ratchet, Curtis & Curtis.....30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools...$1.75@$1.85
Twist Drills—
Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%

Drill Bits.—See Augers and Bits

Drill Chucks.—See Chucks.

Dripping Pans—
Small sizes.....₱ ℔ 6½¢
Large sizes.....₱ ℔ 5¾¢

Egg Beaters.
Dover.....₱ doz $1.50
National, ₱ doz $4.50.....33⅓%
Family (T. & S. Mfg. Co.), ₱ gro $17.00@$18.00
Duplex (Standard Co.).....₱ doz $1.25
Rival (Standard Co.).....₱ doz $1.00
Duplex Extra Heavy (Standard Co.)....₱ doz $3.50
Triumph (T. & S. Mfg. Co.), ₱ gro $10.50@$11.50
Advance, No. 1.....₱ gro $10.50
Advance, No. 2.....₱ gro $10.00
Bryant's.....₱ gro $14.00
Ayres' Spiral.....₱ gro $5.00
Double (H. & R. Mfg. Co).....₱ gro $16.20
Easy (H. & R. Mfg. Co.).....₱ gro $14.00
Triple (H. & R. Mfg. Co.).....₱ gro $16.20
Spiral (H. & R. Mfg. Co.).....₱ gro $4.50
Paine, Diehl & Co.'s.....₱ gro $24.00

Egg Poachers—
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00.....25%

Electric Bell Sets.—
Wollensak's.....20%
Bigelow & Dowse.....20%

Emery—	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF FF.
Kegs, ₱ ℔	4½¢	5 ¢	2½¢
½ kegs, ₱ ℔	4¾¢	5½¢	2¾¢
¼ kegs, ₱ ℔	5 ¢	5½¢	3 ¢
10-℔ cans, 10 in case	6 ¢	6½¢	5 ¢
10-℔ cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—
See Hollow-Ware.

Escutcheon Pins—
Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Escutcheons.
Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Faucets.—
Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₱ doz $50.00.....20&10%
Lane's, ₱ doz $36.00.....25&10%
Victor, ₱ doz $36.00.....25 &10%

Felloe Plates.....₱ ℔ 6@6½¢

Fifth Wheels.—
Derby and Cincinnati.....50&5%
Brewster.....55&5%

Files—
Domestic—
Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
Other makers, best brands....60&10@70%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10@60&10&5%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut..50&10%
Imported—
Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 60%

Fluting Machines—
Knox, 4¼-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3½-inch Roll, $2.15.....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₱ doz $15.30.....40%
Shepard Hand Fluter, No. 110 ₱ doz $11.00.....40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00.....40%
Clark's Hand Fluter. ₱ doz $15.00.....35%
Combined Fluter and Sad Iron, ₱ doz $15.00.....30%
Buffalo.....₱ doz $10.00.....10%

Fluting Scissors—.....45%

Fodder Squeezers—
Blair's.....₱ doz $2.00
Blair's "Climax".....₱ doz $1.25

Forks—
Hay, Manure, &c., Asso List.....70%
Hay, Manure, &c., Phila. List 60@60&5%
Plated, see Spoons.

Freezers, Ice Cream—
Buffalo Champion.....65&65&5%
Shepard's Lightning.....65 @ 65&5%
White Mountain.....50&20&5%
New Arctic.....50&40&5%
American.....60%
Gem.....65%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless and Giant.....60&10
Zero and Pet.....65&10
Boss.....65&10&10
Keystone, each, $1.50.....25%

Fruit and Jelly Presses—
Enterprise Mfg. Co.....20&10@30%
Hents.....₱ doz $2.50
Shepard's Queen City.....40%

Fry Pans—
Standard List:

No.	0	1	2	3	4
₱ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.	5	6	7	8	
₱ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....70&10 @ 75%
Acme Fry Pans.....60&10%

Fuse— ₱ 1000 ft
Common Hemp Fuse, for dry ground.$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 4.25
Double Taped Fuse, for very wet gr. 5.40
Triple Taped Fuse, for very wet gr.. 6.50
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gauges—
Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch, 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....50@50&5%
Wire, Brown & Sharpe's.....10@20%

Gimlets—
Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₱ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₱ gr $12.....25@25&5%

Glue—
Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process 25@25&5%

Glue Pots—
Tinned.....40%
Enameled.....40&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Grindstones—
Small, at factory.....₱ ton $7.50@9.00

Grindstone Fixtures—
Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%

Hack Saws.—
See Saws.

Halters—
Covert's, Rope, ½-in. Jute.....50&2%
Covert's, Rope, ½-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&2%
Covert's Jute Horse and Cattle Ties, 60&10&2%

Hammers—
Handled Hammers—
Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.... } List Jan. 15, '87
Humason & Beckley... } 50@50&10%
Atha Tool Co..... }
Fayette R. Plumb.....40&10@50%
C. Hammond & Son. List, Oct., 1889, 50%
Verree.....5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%
Heavy Hammers and Sledges—
3 ℔ and under.....₱ ℔ 40¢
3 to 5 ℔.....₱ ℔ 36¢ } 70@70&10%
Over 5 ℔.....₱ ℔ 30¢ }
Wilkinson's Smiths.....10½¢@11¢₱ ℔

Handcuffs and Leg Irons—
R. I. Tool Co., Handcuffs, $15.00₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00₱ doz 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00.....25

Handles—
Iron, Wrought or Cast—
Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.18	1.35	1.50

60&10&10%
Roggin's Latches.....₱ doz 30@35¢
Bronze Iron Drop Latches..₱ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door, ₱ doz $1.40.....10&10%
Chest and Lifting.....70%
Handles, Wood—
Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₱ gr $2.00
Hickory Firmer Chisel, ass'd.₱ gr 4.50 } 50% off
Hickory Firmer Chisel, large. ₱ gr 5.00 }
Apple Firmer Chisel, ass'd...₱ gr 5.00 }
Apple Firmer Chisel, large...₱ gr 6.00 }
Socket Firmer Chisel, ass'd..₱ gr 3.00 }
Socket Framing Chisel, ass'd. ₱ gr 5.00 }
J. S. Smith & Co.'s Pat File.....50%
File, assorted.....₱ gr 9 75 } 40@
Auger, assorted.....₱ gr 5.00 } 40&10%
Auger, large.....₱ gr 7.00 }
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass'.....₱ set $1.25
Pat. Auger, Swan's.....₱ set $1.00
Hoe, Rake Shovel, c.....50&10

Cross-Cut Saw Handles—
Atkins' No. 1 Loop, ₱ pair, 28¢; No. 3, 18¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Boynton's Loop Saw Handles, 50¢... 60%
Champion.....15¢

Hangers—
Barn Door, old patterns...60&10&10@70%
Barn Door, New England..60&10&10@70%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....45%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction 60%
Climax Anti-Friction for Wood Track.55%
Zenith for Wood Track..... ... ...55%
ed's Steel Arm..... .....50%
allenge, Barn Door 50%
Sterling's Imp'ved (Anti-Friction).65&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00 .....50&2%
Cheritree .....50&10%
Kidder's .....50&10&60%
The Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₱ doz pr. 4 in, $10.00; 5 in. $12.00 .....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Pat., No. 4, $12.00; No. 5, $14.40; No. 6, $18.00.....50&15@60%
Wood Track Iron Clad, ₱ ft. 10¢.....50 &15@60%
Carrier Steel Anti-Friction.....50@50&5%
Architect, ₱ set $6.00.....20%
Eclipse.....20&10%
Felix, ₱ set $4.50.....20%
Richards'.....30@30&10%
Lane's Steel Anti-Friction.....50%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat.....20@20&10%
Stearns' Anti-Friction.....20@20&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless.....40@40&5%
American, ₱ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&1 ½
Paragon, Nos. 5, 5½, 7 and 8.....20&1 ½
Crescent.....60@60&10%
Nickel, Cast Iron.....50%
Nickel, Malleable Iron and Steel.....40%
Scranton Anti-Friction Single Strap..33⅓%
Scranton Anti-Friction Double Strap..40%
Universal Anti-Friction.....40%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10@40&10&5%
May.....50&5@50&10%
Barry, $6.00.....40&10%

Harness Snaps—
See Snaps.

Hatchets—
List Jan. 1, 1886.
Isaiah Blood.....35@40%
Hunt's Shingling, Lath and Claw..40&5%
Hunt's Broad.....40%
Buffalo Hammer Co.....40&10@50%
Hurd's.....40@40&50%
Fayette R. Plumb.....40&10@50%
Wm. Mann, Jr., & Co.....50@50&5%
Underhill Edge Tool Co.....40&5@40&10%
Underhill's, Haines and Bright.....33⅓%
C. Hammond & Son.....40&10@50%
Simmons'.....40&10@50%
Peck's.....40&10@40&10&5%
Kelly's.....50@50&5%
Sargent & Co.....50%
Ten Eyck Edge Tool Co.40&10@40&10&5%
Collins.....10%
Schulte, Lohoff & Co. .....50@50&5%

Hay and Straw Knives—
Lightning..Mfrs'. price ₱ doz $18.00, 25% But jobbers cut this price freely.
Gem.....₱ doz $10
Wadsworth's.....40&7½@40&10%
Carter's Needle.....₱ doz $11.50@$12.00
Heath's.....₱ doz $13.50@14.00
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay .....₱ doz $10.00

Hinges—
Wrought Iron Hinges
Strap and T.....70&10@75%
Screw Hook and Strap: 6 to 12 in., ₱ lb. 4 2-10¢; 14 to 20 in., ₱ lb. 3 7-10¢; 22 to 36 in., ₱ lb. 3 2-10¢
Heavy Welded Hook: 6 to 12 in., ₱ lb. 4 2-10¢; 14 to 20 in., ₱ lb. 3 7-10¢; 22 to 36 in., ₱ lb. 3 2-10¢
Screw Hook and Eye: ½ in., ₱ doz $1.50; ⅝ in., ₱ doz $2.45; ¾ in., ₱ doz $3.80 } 10%
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges ("Providence"): 8, 10 & 12 in., ₱ lb. ....5¢; over 12 in., ₱ lb. ....4¢
Spring Hinges—
Geer's Spring and Blank Butts.....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch 55%
American, Gem, and Star.....20%
Oxford.....20%
Barker's Double Acting.....20&10%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15&20%
Chicago.....30%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Gate Hinges—
Western.....₱ doz $4.40, 60%
N. E.....₱ doz $7.00, 55%
N. E. Reversible.....₱ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₱ doz $5.00, 55&10%
Automatic .....₱ doz $12.50, 50%
Common Sense..₱ doz pair $4.50, 50%
Seymour's.....45&10%
Shepard's.....60&10&5%
Reed's Latch and Hinges. ₱ doz $12.00, 50%

Blind Hinges—
Parker.....75&2%
Palmer.....50&5&10%
Seymour.....70&2%
Nicholson.....45&10%
Rider 50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5@80%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 13 75&10@55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless.....75&10&5%
Niagara.....80&2½%
Buffalo.....80&5%
Clark's Genuine Pat.....80&5%
G. S., Lull & Porter.....75&10@80%
Acme, Lull & Porter.....75&5%
Queen City Reversible.....75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50. .....25&2%

Hoes—
Handled—
Garden, Mortar, &c.....70%
Planter's, Cotton, &c.....70%
Warren Hoe.....60%
Magic.....₱ doz $4.00
Eye—
D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern..30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat. 60&5@60&10%
Hubbard & Co., S. & O. Pat.60&5&@60&10%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub .....60@60&10%

Hog Rings and Ringers—
Hill's Improved Ringers. . .₱ doz $4.25
Hill's Old Style Ringers.....₱ doz $2.75
Hill's Tongs. .....₱ doz $4.50
Hill's Rings.....₱ doz bxs $2.15@2.25
Perfect Rings.....₱ doz bxs $1.60@1.70
Perfect Ringers.....₱ doz $2.15@$2.25
Blair's Hog Ringers.....₱ doz $2.25@2.50
Blair's Hog Rings.....₱ doz 20¢@$1.00
Champion Ringers.....₱ doz $2.00
Champion Rings, Double.....₱ doz $2.25
Brown's Ringers.....₱ doz $2.00
Brown's Rings.....₱ doz $1.25@1.30

Hoisting Apparatus—
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Differential Pulley Block...40%
Energy Mfg. Co's.....25%

Holders, File and Tool—
Balz Pat.....₱ doz $4.00; 25%
Nicholson File Holders..... ... 20%

Hollow-Ware—
Iron—
Stove Hollow-Ware—
Ground.....55&5@60&5%
Unground.....65&10@65&10&5%
White Enameled-Ware—
Maslin Kettles .....60&10&10%
Boilers and Saucepans.....40&5%
Tinned Boilers and Saucepans.....40&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%
Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Rustless Hollow-Ware.....50@50&5%
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Silver Plated—
4 mo. or 5 % cash in 30 days.
Reed & Barton..... } 40&5%
Meriden Britannia Co..... }
Simpson, Hall, Miller & Co..... }
Rogers & Brother..... }
Hartford Silver Plate Co..... } 40&5&5%
William Rogers Mfg. Co..... }

Hooks—
Cast Iron—
Bird Cage, Sargent's list..... }
Bird Cage, Reading..... } 60&10&10%
Clothes Line, Sargent's list.. }
Clothes Line, Reading list. 60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading..50&10@50&10&10%
Wrought Iron—
Cotton.....₱ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)...50%
Wrought Staples, Hooks, &c. See Wrought Goods.
Wire—
Wire Coat and Hat, Gem, list April, 1886.....50%
Wire Coat and Hat, Miles', list April, 1886.....50%
Indestructible Coat and Hat.....45%
Wire Coat and Hat, Standard.....45%
Belt. .....80@80&10%
Miscellaneous.
Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₱ doz $2.25
Bush.....55@60%
Whiffletree—Patent 55%
Hooks and Eyes—Malleable Iron. 70&70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks .....See Bench Stops.

Horse Nails—

Nos.	6	7	8	9	10
Ausable.....	28¢	26¢	25¢	24¢	23¢.

25&10@25&10&10%
Clinton, Fin.. .....10½ @ 11¢, net
Essex ....28¢ 26¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Lyra. .....25¢ 23¢ 22¢ 21¢ 20¢. 40&10&5@50%
Snowden ...25¢ 23¢ 22¢ 21¢ 20¢. 40&10&5@50%
Putnam.....23¢21¢ 20¢ 19¢ 18¢. 1000 ℔ in year 15%
Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢..12½&5%
Northwest'n.25¢ 23¢ 22¢ 21¢ 20¢. 25@25&5%
Globe .....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
Boston.....23¢ 21¢ 20¢ 19¢ 18¢.20&2½%
A. C.....25¢ 23¢ 22¢ 21¢ 20¢. 25&10@33⅓&5%
C. B.-K.....25¢ 23¢ 22¢ 21¢ 20¢. 25¢10@33⅓&5%
Champlain .28¢ 6¢ 25¢ 24¢ 23¢. 25&10&10%
New Haven..28 26¢ 25¢ 24¢ 23¢. 25&10&25&10&10%
Saranac.....23¢ 21¢ 20¢ 19¢ 18¢...30&10%
Champion ...25¢ 23¢ 22¢ 21¢ 20¢. 10&10&10%
Capewell.....28¢ 26¢ 5¢ 24¢ 23¢. 35&5@35&10%
Star.....23¢ 21¢ ¢ 19¢ 18¢. 10&10@10&12½%
Anchor.....23¢ 21¢ 20¢ 19¢ 18¢.....35%
Western.....23¢ 21¢ 20¢ 19¢ 18¢..40&10%
Empire Bronzed. .....14 ₱ lb.

Horse Shoes—See Shoes Horse.

Hose, Rubber—
Competition.....75&10@75&10&5%
Standard.....70&70&10%
Extra.....60&60&10%
N. Y. B. & P. Co., Para.....30&10%
N. Y. B. & P. Co., Extra.....50%
N. Y. B. & P. Co., Dundee.....60&10&5%

Huskers—
Blair's Adjustable.....₱ gr $8.00
Blair's Adjustable Clipper....₱ gr 7.00
Hubbard's Solid Steel.....₱ gr 4.50

Indurated Fiber-Ware—25%.
Spittoons, No. 2, ₱ doz.....$9.00
Basins, Ringed, ₱ doz., No. 1, $4.80; No. 2, $4.20; No. 3.....$3.60
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ nest.....$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ nest.....$3.70
Butter Bowls 15, 17 and 19-inch (3 pieces), ₱ nest.....$2.25
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces) ₱ set.....$4.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), ₱ set.....$3 00
See also *Pails.*

Jack Screws—See Screws.

Kettles— Spun. Stamped.
Brass, 7 to 17 in., ₱ ℔.... 24¢ 21 ¢
Brass larger than 17 in., ₱ ℔..... 26¢ 23½¢
Enameled and Tea Kettles. See *Hollow-Ware.*

Keys—
Lock Asso'n list Dec. 30, 1886...50&10@ 60&5%
Eagle, Cabinet, &c .....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₱ doz $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—
Parkin's.
Applewood Handles...₱ doz $6.00, 40%
Rosewood or Cocobolo.₱ doz $9.00, 40%

Knives—
Wilson's Butcher Knives.....25@30%
Ames' Butcher Knives 25%
Foster Bros.' Butcher, &c.....40%
Nichols' Butcher Knives.....40&10%
Ames' Shoe Knives.....20@25%
Ames' Bread Knives. ₱ doz $1.50, 15@20%
Moran's Shoe and Bread.....20%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat. $2.00
Corn, Auburn Mfg. Co. Crescent.....$3.50

Knobs—
Door Mineral.....65@68%
Door Por. Jap'd.....75@78%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Wash Trough or Wood, list Dec., 1885...40%
Furniture Plain .....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....30&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₱ gro 80¢, 60&10%

Ladles,—
Melting, Sargent's.....55&10%
Melting, Reading .....35&10%
Melting, Monroe's Pat..₱ doz $4.00, 40%
Melting, P. S. & W.....35&10&40%
Melting, Warner's.....30%

Lanterns—
Tubular—
Plain with Guards, ₱ doz.....$4.00@4.25
Lift Wire, with Guards.....$4.50@4.75
Square Plain, with Guards....$4.00@4.25
Sq. Lift Wire, with Guards....$4.25@4.50
Without Guards, 25¢ ₱ doz less.
Miscellaneous.
Police, Small, $6.00; Medium, $7.25; Large, $9.75.....20@25%

Lawn Mowers—
Standard List.....50&10%
Quaker City.....60&10%
Enterprise.....60&10%

Lemon Squeezers—
Porcelain Lined, No. 1....₱ doz $6.00, 25&30%
Wood, No. 2.....₱ doz $3.00, 35%
Wood, Common.....₱ doz $1.70@1.75
Dunlap's Improved .....₱ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz.....25&10%
Jennings' Star.....₱ doz $2.50
The Boss.....₱ doz $2.50
Dean's..Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90
Little Giant.....50@50&5%
King.....40&5%
Hotchkiss Straight Flash....₱ doz $12.00

Lines—
Cotton and Linen Fish, Draper's.....50%
Draper's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson, Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes. Nos. 12 14 20
$4.0 ..3 50 $3.00
Ventilator Cord, Samson Braided, White or Drab Cotton..₱ doz $7.50, 20%

Locks, &c.—
Door Locks, Latches, &c.
R. & E. Mfg. Co., list Mar. 20, 1889..... } 60&10@60 &10&10 %
Mallory, Wheeler & Co., list July, '88..... } Much lower net prices often made.
Sargent & Co., list Aug. 1, '88 }
Reading Hardware Co., list Feb. 2, '88.. }
Perkins' Burglar Proof.....60&25%
Plate.....33⅓&2%
F. Many's "Extension Cylinder" $10.50 ₱ doz.
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deitz Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Shepardson or U. S.....35%
Felter or American.....40&10%
Seed's N. Y. Hasp Lock.....25%
Cabinet—
Eagle, Gaylord Parker and Corbin... } List March, '84, rev Jan. 1, '85..33⅓&2%
Deitz, Nos. 36 to 39..... } 40%
Deitz, Nos. 51 to 63..... } .....40&10%
Deitz, Nos. 86 to 96..... } 30%
Stoddard Lock Co.....30@33⅓%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin...33⅓%
Yale.....net prices
Romer's.....25%
Padlocks—
List Dec. 23, '84. .....75@75&10%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 93.....30%
Romer's Scandinavian, &c., Nos. 100 to 505...15%
A. E. Deitz.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....45%
Horseshoe.....₱ doz, $9. 40@40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....30@30&10%
E. T. Fraim's Keystone Scandavian: Nos. 119, 120, 130 and 140... ..90&10% Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%

Lumber Tools.
Ring Peavies, "Blue Line"...₱ doz $20.00
Ring Peavies, Common.....₱ doz $18.00
Steel Socket Peavies.....₱ doz $21.00
Mall. Iron Socket Peavies....₱ doz $19.00
Cant Hooks, "Blue Line"..₱ doz $16.00
Cant Hooks, Common Finish..₱ doz$14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₱ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₱ doz $12.00
Hand Spikes....₱ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₱ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₱ doz $18.00

Lustro—
Four-ounce Bottles....₱ doz, $1.75; ₱ gross..... ... .$17.00

Mallets—
Hickory .....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%

Match Safes—
Dangerfield's Self-Igniting...₱ doz $1.50

Mattocks. Regular list..... .....60&5%

Meat Cutters—
Dixon's ₱ doz..... 40&5%

Nos.....	1	2	3	30.00
	$14.00	$17.00		
Woodruff's ₱ doz				.....40&5%
Nos...		.....	100	150
			$15.00	$18.00

Champion ₱ doz .....40&45%

Nos.....	200	300	400
	$22.00	$27.00	$40.00

Hales Pattern ₱ doz..... 70@70&5%

Nos.....	11	12	13
	$27.00	$33.00	$45.00

American.....50%

Nos.....	1	2	3	4	5
Each.....	$5	$7	$10	$25	$50

Enterprise.....30%

Nos.....	10	12	22	32	42
Each.....	$3	$2.50	$4	$6	$15

Pennsylvania.....40&10%

Nos.....	1	2	3	00
₱ doz....	$24.00	$28.00	$36.00	$28.00

Miles' Challenge ₱ doz .....45@45&10%

Nos.....	1	2	3
	$22.00	$30.00	$40.00

Home No. 1.....₱ doz, $25.00, 55&10%
Draw Cut, each:

Nos..5	2	6	8
$50	$75	$80	$225

.....20@25%
Beef Shavers (Enterprise).....20&10@30%
Chadborn's Smoked Beef Cutter. ₱ doz $66.00

Mincing Knives—
Am. (2d quality., ₱ gr., 1 blade blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ₱ doz, Single, $18.....Double, $3 40@45%
Knapp & Cowles.....50&10@20%
Buffalo Adjustable..... ₱ doz $3.00, 25%
Buffalo Double Adj'table. ₱ doz $3.00 25%

Molasses Gates—
Stebbin's Pattern..... 75@75&10%
Stebbin's Genuine.....60&10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....20%
Lincoln's Pattern.....70@70&10
Weed's.....20&10%
Boss, ₱ doz:
Nos. 1, $7; No. 2, $8; No. 3, $9; No. 4 $10.....60&10&10%

Money Drawers....₱ doz, $18@$20

Muzzles—
Safety.....₱ doz, $3.00, 25 %

Nails, see Trade Report.
Wire Nails, Papered.
Association list, July 15, 1889....70&5%
Tack Mfrs.' list.....60&10&10%
Wire Nails, Standard Penny.
Card June 1, '89, base.....$3.00 @ $3.10

Nail Puller—
Curtiss Hammer.....₱ doz $9.00
Giant, No. 1.....₱ doz. $18.00, 10%
Giant, No. 2.....₱ doz, $15.00, 10%
Pelican.....₱ doz, $9.00, 25%

Nail Sets—
Square.....₱ gr., $4.00@$4.25
Round.....₱ gr. $3.25
Cannon's Diamond Point.....₱ gr., $12, 20%

Nut Crackers—
Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₱ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Nuts—
uts ,off list Jan. 1, 1888: Square. Hex.
Hot Pressed..... 5.1¢ 5.8¢
Cold Punched..... 5.1¢ 5.4¢
In lots less than 100 ℔, ₱ ℔, add ½¢; 1-℔ boxes, add 1¢ to list.

Oakum—
Government.....₱ ℔ 7½@7¾¢
U. S. Navy.....₱ ℔ 6½@6¾¢
Navy.....₱ ℔ 5½@5¾¢

Oilers—
Zinc and Tin.....65@65&10%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&10%
Malleable, Hammers, Old Pattern, same list.....40%
Prior's Pat. or "Paragon" Zinc. 60@60&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Gem P. D. & Co.....₱ gro. $2

Packing, Steam—
Rubber—
Standard.....60&10@60&10&10%
Extra.....50&10@60%
N. Y. B. & P. Co., Standard....50&10&5%
N. Y. B. & P. Co., Empire.....70%
N. Y. B. & P. Co., Salamander. ₱ ℔ 65¢, 30%
Jenkins' Standard.....₱ ℔ 80¢, 35%
Miscellaneous—
American Packing.....10@@11¢ ₱ ℔
Russia Packing.....14¢ ₱ ℔
Italian Packing.....13@@14¢ ₱ ℔
Cotton Packing.....15@@17¢ ₱ ℔
Jute.....7@@8¢ ₱ ℔

Padlocks—
See Locks.

Pails—
Galvanized Iron—See Trade Report

Quarts	10	12	14
Hill's Light Weight, ₱ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₱ dz.	3.00	3.25	3.75
Whiting's	2.75	3.00	3.25
Sidney Shephard & Co.	2.94	3.15	3.37
Iron Clad	2.50	2.75	3.00
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.
Indurated Fibre Ware—25%
Star Pails, 12 qt.....₱ doz $6.00
Fire, Stable and Milk, 14 qt..₱ doz $7.80
Standard Fibre Ware—

	Plain.	Deer'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	
Sugar Pails	6.00	6.50
Horse Pails	5.00	
Buggy Pails	4.00	
Slop Jars (bal. trap)	8.00	9.00
Chamber Pails, 14-qt	6.50	7.50

Pencils—
Faber's Carpenters'.....high list 50%
Faber's Round Glit.....₱ gro $5.25
Dixon's Lead.....₱ gro $4.50
Dixon's Lumber.....₱ gro $6.75
Dixon's Carpenters'.....40&10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60 @ 60&5%

Picture Nails—
Brass Head, Sargent's list.....50&10&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list..40&10%
Niles' Patent.....40%

Pinking Irons— ₱ doz 65¢ net

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain.....50%
1¼ and under, Galvanized.....42½%
1½ and over, Plain.....62½%
1½ and over, Galvanized.....50%
Boiler Tubes, Iron.
1¾ and under.....50%
2 in. and larger.....55%

Planes and Plane Irons—
Wood Planes—
Molding.....50&10&2%
Bench, First Quality.....55&10&2%
Bench, Second Quality.....60&10&2%
Bailey's (Stanley R. & L. Co.).....40&10%
Iron Planes—
Bailey's (Stanley R. & L. Co.).....40@10%
Miscellaneous Planes (Stanley R. & L. Co.).....20@10%
Victor Planes (Stanley R. & L. Co.).20@10%
Steer's Iron Planes.....35@35&5%
Merrien Mal. Iron Co.'s.30&10@30&10&10%
vis's Iron Planes...30&10@30&10&10%
Birmingham Plane Co.....50@50&5%
Gage Tool Co.'s Self-Setting.....20&10%
Chaplin's Iron Planes.....40@40&5%
Sargent's.....30&10@30&10&10%
Plane Irons—
Plane Irons.....20&10%
Plane Irons, Butcher's...$5.00@$5.25 to £
Plane Irons, Buck Bros.....30%
Plane Irons, Auburn Tool Co., "Thistle".....35%
Sandusky Tool Co.:
Single and Cut.....30%
Double.....40%
L. & I. J. White.....25%

Pliers and Nippers—
Button's Patent.....30&10@40%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz.....20&10@33½%
Humason & Beckley Mfg. Co..50@50&10%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P. S. & W. Cast Steel.....50%
P. S. & W. Tinners' Cutting Nippers, add 5% dis 10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₱ doz, $12.00.....30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—
Regular List.....70&10@70&10&10%
Disston's.....45&10%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis' Inclinometers.....10&10%

Polish, Metal.
Prestoline.....20&10%
Prestoline Paste.....33½%
Gaston's Silver Compound.....33½%

Pokes, Animal—
Bishop's I. X. L.....₱ doz $6.50
Bishop's O. K.....₱ doz $5.50
Bishop's Pioneer.....₱ doz $3.75
Bishop's American.....₱ doz $3.00

Poppers, Corn—
Round or Square, 1 qt..₱ gr $10.00@10.50
Round or Square, 1½ qt..₱ gr $15@15.50
Round or Square, 2 qt..₱ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—
Samson Post Hole Digger, ₱ doz $36.00. 25&10%
Fletcher Post Hole Augers, ₱ doz $36, 20%
Eureka Diggers.....₱ doz $16.00@17.00
Leed's.....₱ doz $8.00@9.00
Vaughan's Post Hole Auger, ₱ doz $13.00@14.00
Kohler's Little Giant.....₱ doz $18.00
Kohler's Hercules.....₱ doz $15.00
Kohler's New Champion.....₱ doz $9.00
Schneidler.....₱ doz $18.00
Ryan's Post Hole Diggers...₱ doz $24.00
Cronk's Post Bars, ₱ doz $60.00, 50&5@50&10%
Gibbs Post Hole Digger, ₱ doz $30.00, 50%
Imperial, ₱ doz, $15.....45%

Potato Parers—
White Mountain.....₱ doz $5.00@5.50
Antrim Combination.....₱ doz $8.00
Hoosier.....₱ doz $13.50

Pruning Hooks and Shears—
Disston's Combined Pruning Hook and Saw.....₱ doz $18.00, 20&10%
Disston's Pruning Hook, ₱ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools.....40%
Pruning Shears, Henry's Pat, ₱ doz $3.75@4.00 net
Henry's Pruning Shears, ₱ doz $4.25@4.50 net
Wheeler, M. & C. Co.'s Combination, ₱ doz $12.00, 20%
Dunlap's Saw and Chisel, ₱ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2, 7.25

Pulleys—
Hot House, Awning, &c.....60&10%
Japanned Screw.....60&10%
Brass Screw.....60&10%
Japanned Side.....66⅔&10%
Japanned Clothes Line.....60&10%
Empire Sash Pulley.....55@60%
Moore's Sash, Anti-Friction.....50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50.....50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70.....50%
Hay Fork, "F" Common and Pat. Bushed.....20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating...40%
Shade Rack.....45%
Tackle Blocks.....See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00.....40%

Pumps—
Cistern, Best Makers.....60@60&10%
Pitcher Spout, Best Makers...67½@70%
Pitcher Spout, Cheaper Goods.70@70&5%

Punches—
Saddlers' or Drive, good, ₱ doz...60@65¢
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis & Call Co.'s Springfield Socket.50&5%
Spring, good quality....₱ doz $2.50@2.60
Spring, Leach's Pat.....15%
Bemis & Call Co.'s Spring and Check..40%
Solid Tinners'.....₱ doz $1.44, 55%
Tinners' Hollow Punches.....20&2%
Rice Hand Punches.....15%
Avery's Revolving.....40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door, Wr't Brass, ₱ ℔ 35¢.....15%
Sliding Door, Bronzed Wr't Iron..₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door, Light Iron. ½ ⅝ ¾
Per 100 feet.....$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet....$2.15 2.70 3.25..net
Terry's Steel Rail, ₱ foot.....4½¢
Victor Track Rail, 7¢ ₱ foot.....50&2%
Carrier Steel Rail, ₱ foot.....4½¢
Moore's Wrought Iron.....25%

Rakes—
Cast Steel, Association goods.....70%
Cast Steel, outside goods.....60&10&70%
Malleable.....70&70&5%
Gibbs Lawn Rake.....$12.00, 50&15%
Canton Lawn Rake.....$9.00, 50&10%
Ft. Madison Prize Bow Brace and Peerless.....65%
Fort Madison Steel Tooth Lawn Rake, $6.00.....25%

Razors—
J. R. Torrey Razor Co.....20%
Wostenholme and Butcher, $10.00 to £, 10%
Jordan's AAA1, list Nov. 1, 1889.....50%
Jordan's Old Faithful, list Nov. 1, '89.50%

Razor Strops—
Genuine Emerson.....60@60&5%
Imitation "....₱ doz $2.00, 20&10&5%
Torrey's.....20%
Badger's Belt and Com.....₱ doz $2.00
Lamont Combination.....₱ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89.50%

Rivets and Burrs—
Iron, list Nov. 17, '87.....45%
Copper.....50&50&10%

Rivet Sets.....50&10%

Rods—
Stair, Brass.....25&2%
Stair, Black Walnut.....₱ doz 40¢

Rollers—
Barn Door, Sargent's list.....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller.....70%

Rope—
Manufacturers' prices:
Manila...⅜ in. and larger ₱ ℔ 14½¢
Manila.....⅜ in. ₱ ℔ 14¾¢
Manila.....¼ and 5-16 in. ₱ ℔ 15¢
Manila Tarred Rope.....₱ ℔ 13¾¢
Manila, Hay Rope.....₱ ℔ 14¼¢
Sisal...½ inch and larger ₱ ℔ 11¢
Sisal.....⅜ in. ₱ ℔ 11¼¢
Sisal.....¼ and 5-16 in. ₱ ℔ 11¾¢
Sisal, Hay Rope.....₱ ℔ 11¢
Sisal, Tarred Rope.....₱ ℔ 10½¢
Sisal, Medium Lathe Yarn, ₱ ℔ 10¢
Cotton Rope.....₱ ℔ 15¢18¢ net
Jute Rope.....₱ ℔ 7½¢
1½% for cash in 10 days.

Rules—
Boxwood.....80&10&10@80&10&10&5%
Ivory.....50@50&10%
Starrett's Rules and Straight Edges, Steel.....25&10%

Sad Irons—
From 4 to 10, at factory ...₱ 100 ℔, $2.60@$2.75
Self-Heating.....₱ doz $9.00 net
Self-Heating, Tailors'...₱ doz $18.00 net
Gleason's Shield and Toilet.....25%
Mrs. Pott's Irons.....40@40&10%
Enterprise Star Irons.....40%
Combined Fluter and Sad Iron, ₱ doz, $15.00.....15%
Fox Reversible, Self-Fluter ₱ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England.....6¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible.....20@20&5%
National Self-Heating.....30%

Sand and Emery Paper and Cloth—
List April 19, 1886.....50@50&10%
Sibley's Emery and Crocus Cloth.....30%

Sash Cord—
Common.....₱ ℔, 10@11¢
Patent, good quality.....₱ ℔ 13@13½¢
White Cotton Braided, fair..₱ ℔ 28@29¢
Common Russia Sash.....₱ ℔ 13½¢
Patent " " .....₱ ℔ 15¢
Cable Laid Italian Sash.....₱ ℔ 22¢@23¢
India Cable Laid " .....₱ ℔ 13¢
Silver Lake—
A Quality, White, 50¢.....10&10&5%
A Quality, Drab, 55¢.....10&10&5%
B Quality, White, 50¢.....20&10&5%
B Quality, Drab, 55¢.....20&10&5%
C Quality, White (only).....26½¢@28¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab..30¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson—
Braided, White Cotton, 50¢..30@30&5%
Braided, Drab Cotton, 55¢...30@30&5%
Braided, Italian Hemp, 55¢..30@30&5%
Braided, Linen, 80¢.....30@30&5%

Sash Locks—
Clark's, No. 1, $10; No. 2, $8 ₱ gr..33⅓%
Ferguson's.....33⅓%
Morris and Triumph, list Aug. 16, 1886, 60&2%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₱ gr $4.00
Common Sense, Nickel Plated ₱ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60@60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Stoddard "Practical".....10%
Ives' Patent.....60@60&10%
Llesche's, Nos. 100 and 110, ₱ gr $8; 105, $10.00.....20&10%
Davis, Bronze, Barnes Mfg. Co.....50%
Champion Safety, list March 1, 1888 55@55&5%
Security.....70%
Buckeye.....₱ gro $4.80

Sash Weights—
Solid Eyes.....₱ ton $22.00

Sausage Stuffers or Fillers—
Miles' "Challenge," ₱ doz $20, 50@50&5%
Perry ...₱ doz, No. 1, $15.00: No. 0, $21.00.....50&5@50&10%
Draw Cut No. 4, each $30.00.....20%
Enterprise Mfg. Co.....20&10@30%
Silver's.....40&10%

Saws—
Disston's Circular.....45@45&5% | Extras sometimes given by jobbers.
Disston's Cross Cuts.....45@45&5% | Extras sometimes given by jobbers.
Disston's Hand 25@25&5% | Extras sometimes given by jobbers.
Atkins' Circular Shingle and Heading 50&10%
Atkins' Silver Steel Diamond X Cuts ₱ foot 70¢
Atkins' Special Steel Dexter X Cuts ₱ foot 50¢
Atkins' Special Steel Diamond X Cuts ₱ foot 30¢
Atkins' Champion and Electric Tooth X Cuts.....₱ foot 24@25¢
Atkins' Hollow Back X Cuts..₱ foot 18¢
Atkins' Mulay, Mill and Drag.....40&10%
Atkins' One-Man Saw, with handles, ₱ foot 32¢
W. M. & C., Hand.....30&5@30&10%
W. M. & C., Champion X Cuts, Regular.....₱ foot 24@26¢
W. M. & C. X Cuts, Thin Back, ₱ foot 27¢@29¢
Peace Circular and Mill.....45&10%
Peace Hand Panel and Rip 20&10@20&10&10%
Peace Cross Cuts, Standard...₱ foot 25¢
Peace Cross Cuts, Thin Back ₱ foot 27@28¢
Richardson's Circular and Mill 45@45&10%
Richardson's X Cuts, No. 1, 39¢; No. 2, 27¢; No. 3, 24¢
Hack Saws—
Griffin's, complete.....40&10@50%
Griffin's Hack Saw, Blades....40&10@50%
Star Hack Saws and Blades.....25%
Diamond Hack Saws and Blades.....25%
Eureka and Crescent.....25%

Saw Frames—
White Vermont.....₱ gro $9.00@10.00
Red, Polished and Varnished.....₱ doz $1.50, 25%

Saw Sets—
Stillman's Genuine...₱ doz $5.00@7.75, 40&5%
Stillman's Imita.....₱ doz $3.25@5.25, 40&5@40&10%
Common Lever.....₱ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00, 40&10@50%
Leach's...No. 0, $8.00; No. 1, $15, 15@20%
Nash's.....20&10@20&10&10%
Hammer, Hotchkiss.....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer.....30&5%
Bemis & Call Co.'s Plate.....10%
Bemis & Call Co.'s Cross Cut.....12½%
Aiken's Genuine.....$13.00, 50&10%
Aiken's Imitation.....$7.00, 55&5%
Hart's Pat. Lever.....20%
Disston's Star, $9, No. 15, $5.50; 20@ 10@20&10@10%
Atkin's Lever, ₱ doz No. 1, $6.00; No. 2, $9.80
Atkin's Criterion.....₱ doz $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00.....40&10%
Avery's Saw Set and Punch.....50%
Am. Tool Co.'s Superior.....₱ doz $15,50%

Saw Tools—
Atkins' Perfection.....₱ doz $15.00
Atkins' Excelsior.....₱ doz $6.00
Atkins' Giant.....₱ doz $4.00

Scales—
Hatch, Counter, No. 171, good quality, ₱ doz $21.00
Hatch, Ten, No. 161....₱ doz $6.75@$7.00
Union Platform, Plain.....$2.10@2.20
Union Platform, Striped.....$2.20@2.30
Chatillon's Grocers' Trip Scales.....50%
Chatillon's Eureka.....25%
Chatillon's Favorite.....10%
Family, Turnbulls.....30@30&10%
Riehle Bros.' Platform.....40%

Scale Beams—
Scale Beams, List Jan. 12, '82...50&10@ 50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.50.....30@10%
Box, 1 Handle.....₱ doz $4.00, 10%
Box, 2 Handle.....₱ doz $6.00, 10%
Defiance Box and Ship.....20&10%
Foot.....50&10@60%
Ship, Common.....₱ doz $3.50 net
Ship, R. I. Tool Co.....10%

Screen Window and Door Frames—
Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons...33⅓@ 33⅓&10%
Stearns' Frames and Corners.25@25&10%

Screw Drivers—
Douglas Mfg. Co.....20&10&10%
Disston's.....45&10%
Disston's Pat. Excelsior.....45&10%
Buck Bros.....30%
Stanley R. & L. Co.'s
Varnished Handles.....65&10%
Black Handles.....60&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60.....66⅔&10&10%
Knapp & Cowles' No. 1.....60&20@70%
No. 1 Extra.....60@60&10%
Nos. 00 & 4.....50&5@50&10&5%
Stearns'.....25&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Elirich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₱ doz $6.00,25&10%
Syracuse Screw-Driver Bits....30&30&5%
Screw Driver Bits.....₱ doz 50@75¢
Screw-Driver Bits, Parr's.....₱ gro $6.25
Fray's Hol. Hdle. Sets, No. 3, $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....20&10%
Brace Screw-Drivers.....25&10%

Screws—
Wood Screws—List March 1, 1889

Flat Head Iron	50%
Round Head Iron	40%
Flat Head Brass	45%
Round Head Brass	35%
Flat Head Bronze	45%
Round Head Bronze	35%

Extra 5 @ 10 % often given

Machine—
Flat Head, Iron.....55%
Round Head, Iron.....50%
Bench and Hand—
Bench, Iron.....55&10@55&10&10%
Bench, Wood, Beech.....₱ doz $2.25
Bench, Wood, Hickory.....20&10%
Hand, Wood.....25&10@25&10&5%
Lag, Blunt Point, according to size.....75&10@80%
Coach and Lag, Gimlet Point.....75%
Bed.....25&5%
Hand Rail, Sargent's.....66⅔&10%
Hand Rail, H. & B. Mfg. Co...70&10@75%
Hand Rail, Am. Screw Co.....75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W.....35%
Jack Screws, Sargent...60&10@60&10&5%
Jack Screws Stearns'.....40@40&10%

Scroll Saws—
Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cabinet Makers', $15.....25%
Barnes' Scroll Saw Blades.....35%

Scythe Snaths..50&5&2@50&10&2%

Shears—
American (Cast) Iron...75&10@75&10&5%
Pruning...See Pruing Hooks and Shears.
Barnard's Lamp Trimmers...₱ doz $5.75
Tinners'.....20&2%
Seymour's, List, Dec., 1881.....60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881.....60&10&10@60&10&10&5%
Heinisch's Tailor's Shears.....33⅓%
First quality C. S. Trimmers..80@80&10%
Second quality C. S. Trimmers.....80&10@80&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....60%
Clauss Shear Co., Japanned.....70%
Clauss Shear Co., Nickeled, same list.60%

Sheaves—
Sliding Door—
M. W. Co., list July, 1888..50&10@60&5%
R. & E., list Dec. 18, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885.....60&2%
Moore's Anti-Friction.....50%
Sliding Shutter—
R. & E. list Dec. 18, 1885.....60&10&2%
Sargent's list.....60&10%
Reading list.....60&10&10%

Ship Tools—
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%

Shoes, Horse, Mule, &c.—
Horse—
Burden's, Perkins', Phœnix, at factory. $4.00
Mule—
Add $1 ₱ keg to above prices.
Ox, Wrought—
Ton lots.....₱ ℔ 9¢
1000 ℔ lots.....₱ ℔ 9½¢
500 ℔ lots.....₱ ℔ 10¢

Shot—
(*Eastern prices 2¢ off, cash, 5 days.*
Drop, ₱ bag, 25 ℔.....$1.21
Drop, ₱ bag, 5 ℔.....30
Buck and Chilled, ₱ 25-℔ bag.....1.40
Buck and Chilled, ₱ 5-℔ bag.....35

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S.....60@60&10%
Griffith's Solid C. S. R. R. Goods.....20%
Old Colony (Sanford Fork & Tool Co).35%
St. Louis Shovel Co.....20@20&7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.....20@20&7½%
Lehigh Mfg. Co.....50&10%
Payne Pettebone & Son, list January, 1886.....30%
Remington's (Lowman's Pat.)30@10&40%
Rowland's, Black Iron.....50&10%
Rowland's Steel.....60&5@60&10%

Shovels and Tongs—
Iron Head.....60&10@60&10&5%
Brass Head.....60&10&10%

Skeins, Thimble—
Western list.....75&5@75&10%
Columbus Wrt. Steel, list Jan. 3, 1889...45&10%
Coldbrookdale Iron Co.....50&10%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....35%

Sieves—
Buffalo Metallic, S. S. & Co.....50&25%
Shaker (Barler's Pat.) Flour Sifters....₱ doz $2.00; ₱ gr $21.60
Electric.....₱ gr $18.00
Hunter's.....₱ doz $2.00
Smith's Adjustable Sifters....₱ doz $2.00
Smith's Adjustable Milk Strainer. ₱ doz $2.00
Smith's Adjustable T. & C. Strainer. ₱ doz. $1.25
Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₱ doz..	75¢	95¢
Mesh 20, Nested, ₱ doz..	90¢	$1.05
Mesh 24, Nested, ₱ doz..	$1.10	1.20

Slates—
School, by case.....50@50&10%

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargent's Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&2%
Covert, New Patent.....50&5&2%
Covert, New R. E.'s.....60&10&2%
Covered Spring.....60&10&10%

Soldering Irons—
Covert's Adjustable, list Jan. 1, 1886. 35&2%

Spoke Shaves—
Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....20&10@30%
Cincinnati.....25&10%

Spoke Trimmers—
Bonney's.....₱ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₱ doz. 55&10%
Douglas'.....₱ doz $9.00, 20%
Cincinnati.....25%

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp. Co.'s list. ..70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo S. S. & Co.....33⅓&2%
Silver-Plated—(4 mos. or 5% cash 30 days).
Meriden Brit. Co., Rogers.....50%
C. Rogers & Bros.....50%
Rogers & Bro.....50%
Reed & Barton.....50%
Wm. Rogers Mfg. Co.....50&10@60%
Simpson, Hall, Miller & Co.....50&10
Holmes & Edwards Silver Co...60@60&5%
L. Boardman & Son.....50&10%
Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50%
No. 49 Nickel Silver.....50&10
German Silver.....50@50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5&50&10&5% cash
Britannia.....60%
Boardman's Nickel Silver.....50 } EDGE
Boardman's Britannia Spoons, case lots.....60 } ↓

Springs—
Elliptic, Concord, Platform and Half Scroll.....60@60&5%
Cliff's Bolster Springs.....25%

Squares—
Steel and Iron.....} 75&10@80%
Nickel-Plated.....} full cs. ex. 10%
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels.45&10%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

Standard Fibre Ware—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.....	$2.00	$2.25
Wash-Basins, 12 in.....	2.25	2.75
Keelers, 11¼ in.....		4.00
Cuspidors.....		8.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.....	4.00	
Half-peck Measure.....	3.50	

See also Pails.

Staples—
Fence Staples, Galvanized.} Same price
Fence Staples, Plain.....} as B'rb Wire See Trd. Rep.

Steelyards.....40&10@50%

Stocks and Dies—
Blacksmith's
Waterford Goods.....30&5@30&10%
Butterfield's Goods.....30&5@30&10%
Lightning Screw Plate.....25@30%
Reece's New Screw Plates....33⅓&5@40%
Reversible Ratchet.....30 %
Gardner.....25%

Stone—
Hindostan No. 1, 3¢; Axe, 3¾¢; Slips No. 1, 4½¢
Sand Stone.....₱ ℔ 2½¢
Washita Stone, Extra.....₱ ℔ 19@20¢
Washita Stone, No. 1.....₱ ℔ 14@15¢
Washita Stone, No. 2.....₱ ℔ 10@11¢
Washita Slips, No. 1, Extra..₱ ℔ 36@38¢
Washita Slips, No. 1.....₱ ℔ 24@25¢
Arkansas Stone, No. 1, 4 to 6 in₱ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in₱ ℔ $1.85
Turkey Oil Stone, 4 to 8 in.....₱ ℔ 40¢
Turkey Slips.....₱ ℔ $1.00@1.50
Lake Superior, Chase.....₱ ℔ 16¢
Lake Superior Slips, Chase...₱ ℔ 31@32¢
Seneca Stone, Red Paper Brand....₱ ℔ 18@20¢
Seneca Stone, High Rounds..₱ ℔ 20@25¢
Seneca Stone, Small Whets..₱ gro $24.00

Stove Polish—
Joseph Dixon's.....₱ gro $6.00,*10%
Gem.....₱ gro $4.50, 10%
Gold Medal.....₱ gro $6.00, 25%
Mirror.....₱ pro $6.00, —%
Lustro.....₱ gro $4.75
Ruby.....₱ gro $3.75
Rising Sun, 5 gro lots.....₱ gro $5.50
Dixon's Plumbago.....₱ ℔ $5.00
Boynton's Noon Day, ₱ gro.....13.00
Parlor Pride Stove Enamel..₱ gro $ cans
Yates' Liquid, 2 3 5 10 gal....8¢
₱ gal ...$0.90 .80 .70 .60
Yates Standard Paste Polish, 10-℔ cans. ₱ ℔ 15¢
Jet Black.....₱ gro $3.50
Japanese.....₱ gro $3.50
Fireside.....₱ gro $2.50
Diamond O. K. Enamel.....₱ gro $19.00
Bonnell's Liquid Stove Polish..₱ gro $9.00
Bonnell's Paste Stove Polish..₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....₱ gro $6.00

Tacks, Brads, &c.—
List Oct. 19, 1889, extra 10&2 % cash.
Carpet Tacks—
American Iron, Blued.....72½%
American Iron, Tinned or Cop'd..75%
Steel, Plain or Bright.....72½%
Steel, Tinned or Coppered.....75%
Swedes Iron, Blued.....75%
Swedes Iron, Tinned or Cop'd.....75%
American Iron Cut Tacks.....70%
Swedes Iron Upholst'rs' Tacks, S. S.72½%
Swedes Iron Upholst'rs' Tacks, Tinned, S. S.....75%
Swedes Iron Card and Upholsterers' Tacks, Lanc.....67½%
Swedes Iron Card and Upholsterers' Tacks, Tinned, Lanc.....72½%
Gimp and Lace Tacks Lanc., Swedes Iron.....67½%
Gimp and Lace Tacks, Lanc., Swedes Iron, Tinned.....72½%
Gimp and Lace Tacks, S. S.....72½%
Gimp and Lace Tacks Tinned, S. S..75%
Swedes Iron Basket or Trimmers' Tacks, Lanc.....65%
Miners' Tacks, S. S.....75%
Bill-Posters' or Railroad Tacks, Lanc., Swedes.....70%
Bill-Poster's' or Railroad Tacks, S.S..75%
Copper Tacks.....55%
Copper Finish. & Trunk Nails.....55%
Cigar Box Nails.....50%
Zinc Glaziers' Points.....50%
Picture Frame Points.....50%
Looking-Glass Tacks.....50%
Brush Tacks.....50%
Tin-Capped Trunk Nails.....60%
Finishing Nails.....67½%
Trunk & Clout Nails, Black & Tin'd..70%
Common and Patent Brads.....70%
Hungarian Nails.....70%
Basket and Chair Nails.....65%
Leathered Carpet Tacks.....40%
Miscellaneous—
Double-Pointed.....85%
Wire Carpet Nails.....50&10%
Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tap Borers—
Common and Rind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10&30%
Clark's.....33⅓&35%

Tapes, Measuring—
American.....23⅓&33⅓&5%
Spring.....40%
Chesterman's, Regular list.....25&30%

Thermometers—
Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale—Steel
Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—
Shears and Snips (P. S. & W.).....20@25%
Punches, see Punches.
Snips, J. Mallinson & Co.....33⅓%

Tinware—
Stamped, Japanned and Pl'ced, list Jan. 20 1887.....75@75&5

Tire Benders, Upsetters, &c—
Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Tobacco Cutters—
Champion.....20&10@30%
Wood Bottom.....₱ doz $5.00@$5.25
All Iron.....₱ doz $4.25
Nashua Lock Co.'s ₱ doz, $18.00 50@55%
Wilson's.....55%
Sargent's.....₱ doz, $24, 55&10%
Acme.....₱ doz, $20.00,40%

Transom Lifters—
Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Jan. 1, 1887.
Bronzed Iron Rods.....50&10&2
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's Universal.....40@40&10%

Traps—
Game—
Newhouse.....40@40&5%
Onelda Pattern.....70@70&10%
Game, Blake's Patent.....40&10&5%
Mouse and Rat—
Mouse Wood, Choker, ₱ doz holes, 11@12¢
Mouse, Round Wire.....₱ doz $1.50, 10%
Mouse, Cage, Wire.....₱ doz $2.50, 10%
Mouse, Catch-'em-alive....₱ dz $2.50, 15%
Mouse, Bonanza.....₱ gr $10.00
Mouse Delusion.....₱ gr $15.00
Rat, Decoy.....₱ gr $10.00, 10%
Ideal.....₱ gr $10.00
Cyclone.....₱ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₱ doz , 90¢ ; in full cases, ₱ doz ...75¢
Hotchkiss Imp. Rat Killer..₱ gro $18.50
Hotchkiss New Rat Killer...₱ gro $16.50

Trowels—
Lothrop's Brick and Plastering.25@25&5%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering, 25@25&10%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15&20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Triers—
Butter and cheese.....25%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ⅛ ℔ Balls.....	22¢	30¢
No. 12, ¼ and ⅛ ℔ Balls.....	21¢	29¢
No. 18, ¼ and ⅛ ℔ Balls.....	18¢	28¢
No. 24, ¼ and ⅛ ℔ Balls.....	18¢	28¢
No. 36, ¼ and ⅛ ℔ Balls.....	16¢	27¢

No. 264, Mattrass, ¼ and ⅛ ℔ Balls.48@50¢
Chalk Line, Cotton, ⅛ ℔ Balls.....25¢
Mason Line, Linen, ⅛ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine).....11½¢
3-Ply Hemp, 1 ℔ Balls.....12¢@12½¢
3-Ply Hemp, 1½ ℔ Balls.....11¢@11½¢
Cotton Wrapping, 5 Balls to ℔ ..15¢@16¢
2, 3, 4 and 5-Ply Jute, ⅛ ℔ Balls.....10¢
Wool.....6½¢@6¾¢
Paper.....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ℔ to doz..18¢

Vises—
Solid Box.....50&10@60%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓&35%
Sargent's.....66⅔&10%
Hopkins'.....₱ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Combination Hand Vises.....₱ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....20&10%

Wagon Boxes—
Per ℔.....2¾¢

Wagon Jacks—
Daisy.....25%

Washer Cutters—
Smith's Pat.....₱ doz $12.00, 20&10&10%
Johnson's.....₱ doz $11.00, 33⅓%
Penny's, ₱ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₱ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Washers—

Size.....	½	5-16	⅜	½	⅝	¾	1
Washers....	6½	5½	4½	3½	S	S	3

In lots less than 200 ℔, ₱ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—
Iron.....₱ ℔ 3½¢
Steel.....₱ ℔ 4 ¢

Well Buckets, Galvanized—
See Trade Report.
Hill's.....₱ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₱ doz, 14 qt, $4.25@$4.50
Whiting's Flat Iron Band.....$4.25@4.50
Whiting's Wired Top...₱ doz $4.00@.4.25

Well Wheels—
8 in., $2.25; 10 in., $2.70; 12 in., $3.25

Wire—
Iron—See Trade Report.
Market,
Br. & Ann., Nos. 0 to 18.....67½%
Cop'd, Nos. 0 to 18.....62½%
Galv., Nos. 0 to 18.....57½%
Tin'd, Tinned list Nos. 0 to 18.....57½%
Stone,
Br. and Ann'd, Nos. 16 to 18.....70%
Bright and Ann'd, Nos. 19 to 26..70&5%
Br. and Ann'd, Nos. 27 to 36.....75%
Tinned.....70%
Tinned Broom Wire.....70@70&5%
Galvanized Fence.....60%
Annealed Fence, Nos. 8 and 9.....67½%
Annealed Grape, Nos. 10 to 14.....67½%
Brass, list Jan. 18, 1884.....25%
Copper, list Jan. 18, 1884.....25%
Barb Fence.....See Trade Report
Wire on Spools.....65%
Malin'sSteel and Tin'd Wire on Spools. 50%
Malin's Brass and Cop. Wire on Spools 10%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to 2, 30%
Steel Music Wire, Nos. 12 to 30..55¢ ₱
Picture Wire.....New list, 50%
Barb Wire Safety Guards, ₱ 1000, $9.00, 25%
Wire Clothes Lines, see Lines.

Wire Cloth, Netting, &c.—
Painted Screen Cloth, good quality, ₱ 100 sq. ft., $1.80 @ $1.90
Galvanized Wire Netting.....72½%@75%

Wire Goods—
See Bright Wire Goods.

Wire Rope—
List May 1, 1886.
Iron.....25@30%
Iron, Galvanized.....30%
Cast Steel.....35%

Wrenches—
American Adjustable.....40%
Bax'er's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....55&3%
Coes' "Mechanics'".....55&10&3%
Girard Standard.....70&10%
Machinists', Sterling Wrench Co. 70&10%
Lamson & Sessions' Engineers'..60&10%
Lamson & Sessions' Standard...70&10%
Goes' Pattern, Wrought.....
Girard Agricultural.....} 75&10@75 &10&5%
Lamson & Sessions' Agric'l..
Sterling Wrought.....
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....55%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₱ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....60&3%
Acme, Nickeled.....50&3%
Walker's.....55&3%
Diamond Steel.....55&3%
Cincinnati Brace Wrenches.....15&10%
Cincinnati Monkey Wrenches.....15&10%

Wringers, Clothes—
List March 11, 1889, 2% cash.

Wrought Goods—
Staples, Hooks, &c., list Jan. 12, 1886. 80&20@80&25%

CURRENT METAL PRICES.

DECEMBER 11, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron :
⅜ to 2 in. round and square.. ₩ lb 2 00 @ ....¢
1 to 6 in. x ⅜ to 1 in..... ....
Refined Iron :
⅜ to 2 in. round and square..
1 to 4 in. x ⅜ to 1½ in..... ₩ lb 2.20 @ ....¢
4½ to 6 in. x ⅜ to 1 in .....
1 to 6 in. x ¼ and 5-16 ..... ₩ lb 2.40 @ ....¢
Rods—⅜ and 11-16 round and sq..₩ lb 2.30 @ ....¢
Bands—1 to 6 x 3-16 to No. 12.....₩ lb 2.50 @ ....¢
"Burden Best" Iron, base price..₩ lb 3.00 @ ....¢
Burden's "H. B. & S." Iron, base price..... ₩ lb 2.80 @ ....¢
"Ulster"..... ₩ lb 3.00 @ ....¢
Norway Rods ..... 4.00 @ 5.00¢

Merchant Steel from Store.

	Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2¾¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots	5¢

Sheet Iron from Store.

	Common American.	R. G.	Cleaned.
10 to 16	₩ lb 3.00 @ 3.00¢	3.50 @	....¢
17 to 20	₩ lb 3.25 @ 3.25¢	3.50 @ 3.75	¢
21 to 24	₩ lb 3.35 @ 3.35¢	3.75 @	....¢
25 and 26	₩ lb 3.45 @	3.75 @	....¢
27	₩ lb 3.55 @ 3.62½¢	4.00 @	....¢
28	₩ lb 3.75 @ .. ..¢	4.25 @	....¢
	B. B.		2d qual.
Galv'd, 14 to 20, ₩ lb, 5.00 @ ...		4.75½ @	....¢
Galv'd, 21 to 24, ₩ lb, 5.37½ @ ...		5.12½ @	....¢
Galv'd, 25 to 26, ₩ lb, 5.75 @ ...		5.50 @	....¢
Galv'd, 27 ₩ lb, 6.12½ @ ...		5.85½ @	....¢
Galv'd, 28 ₩ lb, 6.50 @ ...		6.23 @	..¢
Patent Planished ₩ lb A 10¢			B, 8¢
Russia ₩ lb 9½¢ @ 10¢			
American Cold Rolled B. B. ₩ lb 5¢ @ 7¢			
Craig Polished Sheet Steel ₩ lb, 8¼¢			

English Steel from Store.

Best Cast ₩ lb	15 ¢
Extra Cast ₩ lb	16½ @ 17 ¢
Swaged, Cast ₩ lb	16 ¢
Best Double Shear ₩ lb	15 ¢
Blister, 1st quality ₩ lb	12 ¢
German Steel, Best ₩ lb	10 ¢
2d quality ₩ lb	9 ¢
3d quality ₩ lb	8 ¢
Sheet Cast Steel, 1st quality ₩ lb	15 ¢
2d quality ₩ lb	14 ¢
3d quality ₩ lb	12½¢

METALS.

Tin.

	Per lb
Banca, Pigs	23 ¢
Straits, Pigs	23¾¢
English, Pigs	23½¢
Straits in Bars	23¾¢

Tin Plates.

Charcoal Plates.—Bright. Per box.

Melyn Grade	IC, 10 x 14	@ $6 50
" "	IC, 12 x 12	@ 6.75
" "	IC, 14 x 20	@ 6.50
" "	IC, 20 x 28	@ 13.00
" "	IX, 10 x 14	@ 8.00
" "	IX, 12 x 12	@ 8.25
" "	IX, 14 x 20	@ 8.00
" "	IX, 20 x 28	@ 15.75
" "	DC, 12½ x 17	@ 6.00
" "	DX, 12½ x 17	@ 7.50
Calland Grade	IC, 10 x 14	@ 6.50
" "	IC, 12 x 12	@ 6.75
" "	IC, 14 x 20	@ 6.40
" "	IX, 10 x 14	@ 7.65
" "	IX, 12 x 12	@ 7.90
" "	IX 14 x 20	@ 7.65
Allaway Grade	IC, 10 x 14	@ 5.60
" "	IC, 12 x 12	@ 5.75
" "	IC, 14 x 20	@ 5.60
" "	IC, 20 x 28	@ 11.00
" "	IX, 10 x 14	@ 6.75
" "	IX, 12 x 12	@ 6.90
" "	IX, 14 x 20	@ 6.75
" "	IX, 20 x 28	@ 13.50
" "	DC, 12½ x 17	@ 5.30
" "	DX, 12½ x 17 6 00	@ 6.80

Coke Plates —Bright.

Steel Coke.—IC, 10 x 14, 14 x 20		@ $5.12½
	10 x 20	@ 7.25
	20 x 28	@ 10.25
	IX, 10 x 14, 14 x 20	@ 6.00
BV Grade.—IC, 10 x 14, 14 x 20		@ 4.87½

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20		@ $5.10
	20 x 28	@ 10.25
	IX, 14 x 20	@ 5.90
	20 x 28	@ 11.80
Abecarne Grade.—IC, 14 x 20		@ 4.87½
	20 x 28	@ 9.87½
	IX, 14 x 20	@ 5.80
	20 x 28	@ 11.60

Tin Boiler Plates.

IXX, 14 x 26	112 sheets	$13 00 @ $13.00
IXX, 14 x 28	112 sheets	@ 13 25
IXX, 14 x 31	112 sheets	@ 14.75

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

Ingot.

Lake	@ 15½¢
Baltimore Grade	@ 14½¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1889, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
90	72		22	22	22	23	24	25	28	30
90		72	22	22	22	23	25	27	31	....
96	96		22	22	22	24	26	30	32	....
96		96	22	22	23	25	27	31	33	....
48	96		22	22	24	26	28	32	....	....
48		96	22	22	25	27	29	33	....	....
60	96		22	22	27	29	34	....	....	....
60		96	22	23	28	....	....	....	....	....
84	96		23	24	..	....	....	....	....	....
84		96	24	25	....	....	....	....	....	....
Over 84 in. wide			25	27	....	....	....	....	....	....

All Bath Tub Sheets.....	16 oz.	14 oz.	12 oz.	10 oz.	
Per pound.....	$0.25	0.27	0 29	0.32	
Bolt Copper, ⅝ inch diameter and over, per pound.....					22¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier	26¢
12 ounce and up to 14 ounce to square foot	27¢
10 ounce and up to 12 ounce	29¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each.	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each	12¢
Tinning sheets on one side, other sizes, per square foot	2½¢

For tinning both sides double the above prices.

Planished Brass and Copper.

14 x 48.

14 and 16 oz. and heavier..31¢.	By the case...30¢ ₩ lb
12 oz. and lighter..... 33¢.	By the case...32¢ ₩ lb

24 x 48 and 30 x 60.

14 and 16 oz. and heavier..44¢.	12 oz.....37¢ ₩ lb

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1½
8-14	6-12	37	33	30	29	28	27	24
15	13	38	33	31	30	29	28	25
16	14	39	34	32	31	30	29	25
17	15	40	35	33	30	31	30	26
18	16	42	36	34	32	41	30	27
19	17	43	37	35	34	33	32	29
20	18-19	44	39	37	36	35	34	31
21	20	46	41	39	38	37	36	34
22	21	48	42	40	39	38	37	36
23	22	50	44	42	41	40	39	39
24	23	53	46	44	43	41	40	41
25	24	56	49	46	45	44	43	45

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.)

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.50
Fancy Tubing, Brass, to No. 20, inclusive	43¢ ₩ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list	25 @ ... %

Roll and Sheet Brass.

Discount from list..... 25 %

High Brass Rods.

Over 1 inch diameter	27¢
¼ inch to 1 inch diameter, both inclusive	24¢
No. 8 and less than ¼ inch diameter	26¢
Smaller than No. 8	30¢

Hexagon, Octagon and Square, 2¢ ₩ lb advance over Round Rods.

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.	
Western Spelter	6½¢
"Bergenport"	9¢
"Bertha"	9¢

Zinc.

Duty: Sheet, 2½¢ ₩ lb.	
600 lb casks	6½¢
Per lb	7¼¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.	
American	4¼¢
Newark	4¼¢
Bar	4½¢
Pipe, subject to trade discount	6 ¢
Tin-Lined Pipe, subject to trade discount	15¢
Block Tin Pipes, subject to trade discount	45¢
Sheet, subject to trade discount	6¾¢

Solder.

½ @ ½ (Guaranteed)	14¾¢
Extra Wiping	12½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₩ lb 32 ¢
Hallett's	" 23 ¢

Fittings.

Cast Iron Fittings, Black and Galvanized	75 %
Cast Iron Fittings, Bushings & Plugs	75&10@75&10&5 %
Cast Iron Fittings, Flanges	75 %
Malleable Iron Bushings	75&10@75&10&5 %
Malleable Iron Unions	70 %
Malleable Iron American Unions	55 %
Malleable Iron Unions, Keystone	55 %
Wrought-Iron Nipples	75&5@75&10 %
Wrought-Iron Couplings	70 %
Wrought-Iron Long Screws	70@70&5 %
Casing Fittings	60 %
Malleable Iron Fittings	40 %

Valves, Cocks, &c.

Iron Body Valves	70 %
Throttle Valves, Iron Body	70 %
All-Iron Valves	65 %
Compression Gauge Cocks	60 %
Mississippi Gauge Cocks	60 %
Register Gauge Cocks	65@65&10 %
Air Cocks and Radiator Air Cocks	65@65&10 %
Steam Gauge Cocks	60 %
Oil Cups, Plain, Elbow, new pattern, T and Lever Handle	65@65&10 %
Globe Oil Cups	55 %
Common Lubricators	65@65&10 %
Lubricators with Air Cocks	65@65&10 %
Iron Body Lubricators	60 %
Steam Whistles	65 %
Whistle Valves	65 %
Water Gauges	65 %
Brass Expansion Joints	55 %
Pump Valves	55 %
Soldering Unions	65 %
Soldering Nipples	70 %
Brass Unions (Union Joints)	65 %
Radiator Nipples	6 %
Fusible Plugs	60 %
Oil Pumps	55 %
Self-Acting Air Valves	65 %
Vacuum Valves	55 %
Steam Swing Joints	55 %
Iron Strainers	55&10 %
Jenkins' Iron Body Valves, except Gate Valves	60&10 %
Jenkins' All-Iron Valves, except Gate Valves	60 %
Jenkins' Iron Body Gate Valves	55 %
Jenkins' All-Iron Gate Valves	55 %
Iron Cocks, all Iron	65 %
Iron Cocks, with Brass Plugs	65 %
Brass Globe, Angle and Cross Valves	65 %
Brass Globe Valves, Finished	45 %
Brass Globe and Angle Valves, hose outlet	65 %
Brass Garden Hose Valves	65 %
Brass Caps for Hose Valves	60 %
Brass Horizontal, Vertical and Angle Check Valves	65 %
Brass Safety Valves	65 %
Brass Safety Valves, low pressure	65 %
Brass Safety Valves, low pressure, with balance weight	65 %
Brass Butterfly Valves	55 %
Brass Throttle Valves	55 %
Brass Radiator Valves	65 %
Brass Radiator Valves, Jenkins'	65 %
Brass Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves	65 %
Brass Jenkins' Gate Valves	50 %
Brass Steam Cocks	60 %
Brass Gas, Meter and Union Meter Cocks	60 %
Brass Fittings, Rough	60 %
Brass Fittings, Finished	25 %
Brass Bushings	60

Plumbers' Brass Work.

Ground Key Work, Rough	60 %
Ground Key Work, Finished	55 %
Compression Work	60@60&5 %
Compression Work, Grundy, Heavy Pattern	55 %
Chain Stays	60 %
Basin Plugs	60 %
Sink or Bath and Wash Tray Plugs	60 %
Basin Clamps	55 %

PAINTS, OILS AND COLORS.

Animal and Vegetable Oils.

Linseed, City, raw	per gal	60 @	62
" " boiled		63 @	65
" Western, raw		57 @	58
Lard, City, Extra Winter		55 @	56
" " Prime, present make		.. @	54
" " Extra No. 1		45 @	48
" " No. 1		38 @	42
" Western, prime		53 @	54
Cotton-seed, Crude, prime		.. @	28
" " off grades		26 @	27
" Summer Yellow, prime		35 @	36
" " off grades		.. @	34
Sperm, Crude		.. @	65
" Natural Spring		.. @	..
" Bleached Spring		.. @	..
" Natural Winter		76 @	78
" Bleached Winter		81 @	83
Whale, Crude		.. @	40
" Natural Winter		46 @	..
" Bleached Winter		48 @	..
" Extra Bleached		51 @	..
Sea Elephant, Bleached Winter		58 @	60
Menhaden, Crude, Sound		22 @	24
" Crude, Southern		.. @	..
" Light Pressed		27 @	29
" Bleached Winter		32 @	33
" Extra Bleached		36 @	..